

AMERICAN AVIATION

January 12, 1959

Now It's Four Men in the Cockpit

• SCAT Ends Takeoff Guestwork

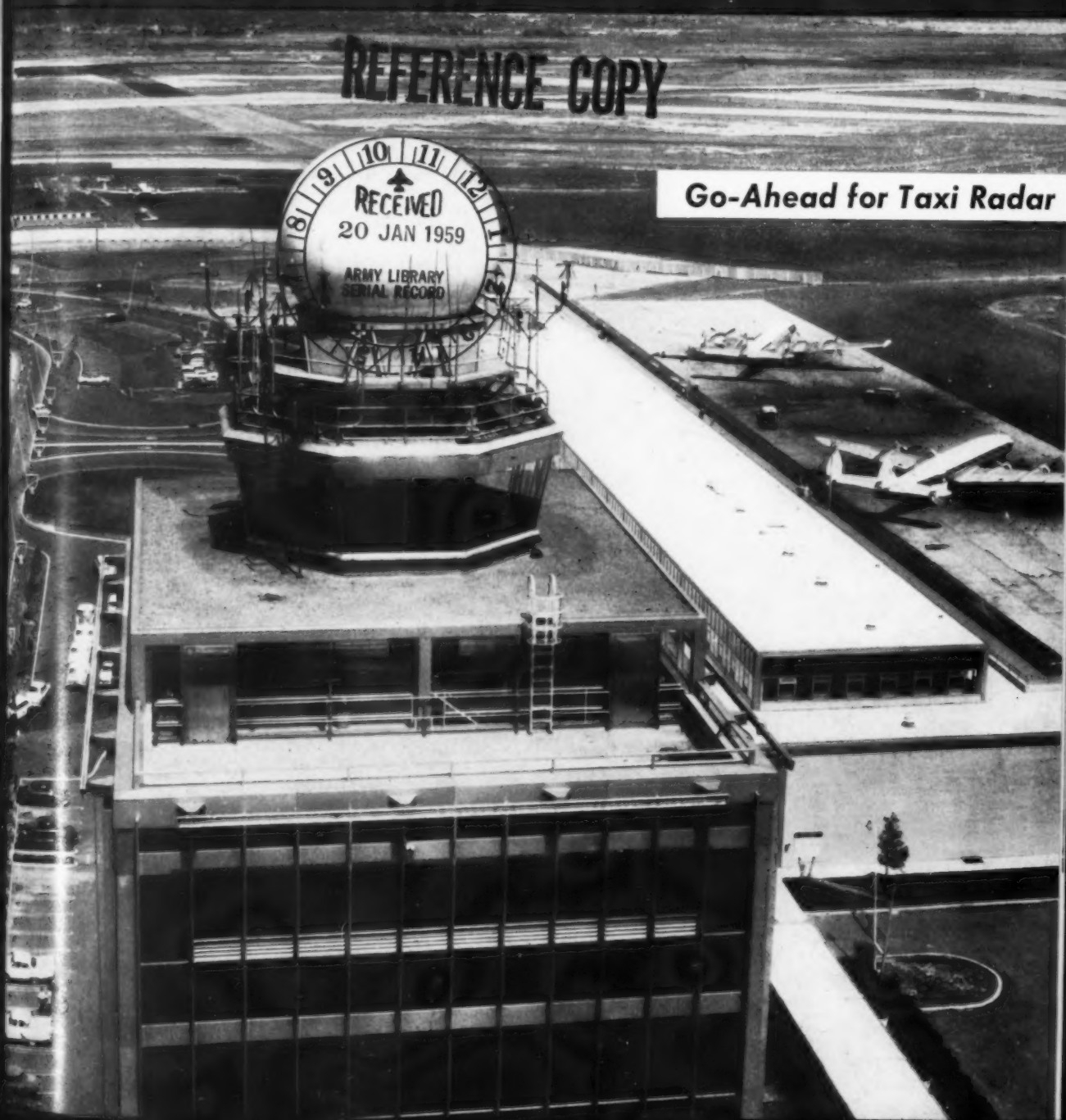
• FAA Opens for Business

• Allegheny Plans Commuter Route

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Go-Ahead for Taxi Radar





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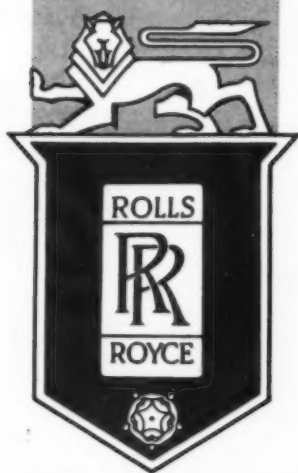
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JANUARY 12, 1959

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3

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DESIGNED FOR WORLD MARKETS

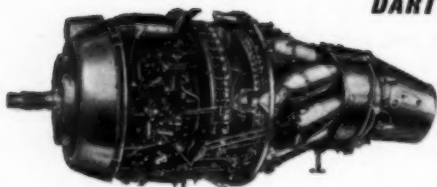
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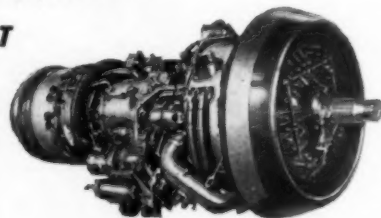
DART PROP-JET



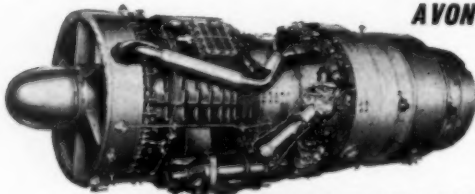
In service or under development at powers ranging from 1,400 to 3,200 h.p. The Dart is the most proven prop-jet in the world and has flown over 6,000,000 hours in scheduled airline service. It has an unexcelled record of reliability and is currently operating at overhaul lives of up to 2,200 hours.

TYNE PROP-JET

The Tyne is an advanced twin spool high compression engine in the 5,000-6,000 h.p. class. It has been designed to give low specific fuel consumption and is backed by the unique experience gained by Rolls-Royce in the operation of gas turbine engines in scheduled airline service.



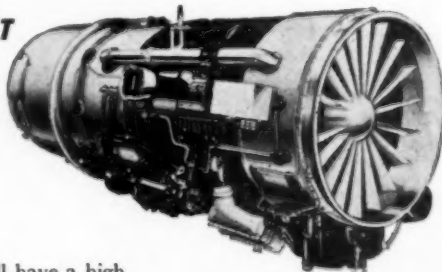
AVON TURBO JET



The Civil Avon has been developed to give low fuel consumption and long life between overhauls. The British Air Registration Board has already authorised its entry into service at an overhaul life of 1,000 hours.

CONWAY BY-PASS TURBO JET

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Beech F50 Twin Bonanza, Grumman F11F-1,
Lockheed 1649A Starliner 47

U. S. ARMY MISSILES



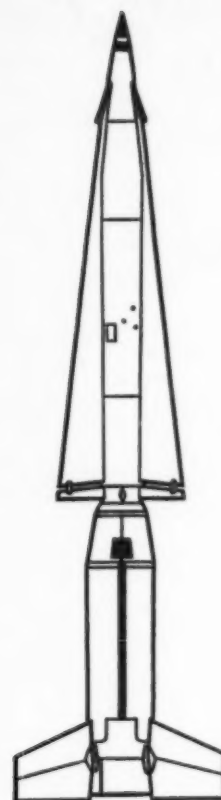
The man:

A U.S. Army missileman working with Nike Hercules missile equipment. The modern Army relies heavily on the special skills and knowledge of men like this who are trained extensively in military schools, and supported technically in the field by Army Ordnance Corps, Western Electric and Douglas field service men.



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Defense of U.S. cities. Army Nike Hercules units are already on duty at many key points...have the important assignment of guarding against enemy aircraft.



The missile:

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—PERSONAL VIEW—

World Showcase in a Desert Gambling Center

There is to be a World Congress of Flight April 12-19 in the gambling capital of Las Vegas, Nevada.

The sponsor is the Air Force Association. Various other organizations have loaned their names as participants. Big names decorate the advance announcements. Industry is expected to foot the high costs. Some companies are enthusiastic, others lukewarm, some violently opposed.

Apparently the underlying motivation is to provide a real showcase for U.S. airpower and air products. A worthy objective. A major showcase has been needed. But so far we have been a bit unclear as to what this big Congress out in the desert of Nevada is all about, what it expects to achieve, and for whom.

In the first place, if it is to be a *World Congress*, it got off the ground much too late to be truly effective. A *world* affair requires at least two years of planning; this one obviously is on a crash basis.

In the second place, the objective seems somewhat baffling. Designers, producers, operators, administrators and users (presumably of airplanes) are to be brought to the Nevada desert "to unite them in a common cause: the advancement of aeronautics and astronautics." Worthy and noble, indeed. But aren't these industry people already united anyway? Are they to congregate in the desert to re-sell each other?

In the third place, there are to be many exhibits indoors and outdoors of airplanes, missiles and other equipment, to be displayed at very considerable cost by industry and government. Are these exhibits for industry people to see each other's handiwork? Or are they for the public? And in Las Vegas yet? For bartenders, chorines, croupiers and week-end slot machine addicts from Los Angeles? How much farther from major population centers can you get?

There has been some talk that AFA wants to put on a show to match the famed annual Farnborough display in England. The objective is commendable, but if the upcoming Las Vegas Congress is the result, then the basic skills and fundamental concept and direction of Farnborough have eluded the sponsors.

One suspects that AFA has overreached itself with this hastily-conceived "World Congress," well-intended as it may be. Shades of the ill-fated Air Power League which spent big sums on a program destined to failure from the start.

There are so many useful promotional jobs to be done instead of adding more affairs which amount to no more than inbreeding. A fraction of the cost of the World Congress devoted to educating USAF and other attaches stationed overseas on U.S. aviation products and U.S. airpower would produce refreshing results; these men are generally abysmally ignorant of U.S. aviation and yet they are in key liaison and communication positions throughout the world. This is but one of many needed projects. AFA sorely needs to reassess its mission in life.

Smathers Takes the Lead

Senator George Smathers of Florida has come out forcefully for legislation to prohibit strikes in public utility industries. He will have support.

The airline labor situation has become a carnival of cold and hot wars. Strikes and threats of strikes are being treated like water faucets by a relatively few individuals and groups who have succeeded in seriously disrupting the air transport of a great nation.

Rates of pay are actually secondary issues in the mass of demands involving all manner of fringe benefits and featherbedding, threatening to saddle the industry with burdens far greater, even, than those which took their toll of railroad economy.

An assessment of the need, the cost and the industry impact of the three-pilot jet agreements by American and Eastern over the year's end will be made later.

In such a chaotic situation, mandatory arbitration is the only solution, with strikes prohibited by law.

Unions seeking their demands with determined inflexibility seem to think nothing of taking their vengeance on the public and the local and national economy. The Christmas present which the pilots handed to the public by shutting down American Airlines during the entire holiday season reflected a shameful lack of responsibility which cannot be explained away by high-flying words of alleged grievances.

Sooner or later unions in public utilities will get what they don't want—mandatory arbitration handed down by a tolerant public that inevitably gets fed up with excesses and abuses.

Wayne W. Parish



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TECO Aircraft Seats

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BUSINESS

Contract to Watch

Letter contract to Convair Division of General Dynamics for 36 B-58 aircraft in an advanced version designed to provide both increased range and speed—to be funded with fiscal 1959 money. Dollar value of contract isn't disclosed although estimates are in the area of \$15 million a copy.

Almost half of the cost is in major and minor subsystems. Raw materials cost about three cents out of each dollar, with standard hardware amounting to another one and one-half cents, purchased parts two and one-half cents, outside production about nine cents, and airframe engineering tooling and manufacture amounting to 37 cents.

Big effort will be to cut costs in the new contract. Follow-on expected will add another 40 aircraft to the production schedule in fiscal 1960.

Airborne Electronics:

Collins Radio Co., Cedar Rapids, Ia.—\$250,476 AMC contract for HF radio communications sets for C-130B and C-133B aircraft.

Technical Products Div., Waste King Corp.—\$600,000-plus United Air Lines contract for 80 flight data recorders.

Lear, Inc.—\$2.9 million AMC contract for Master Attitude Reference Systems (MARS) to retrofit B-52F aircraft.

Hoffman Laboratories Div., Hoffman Electronics Corp., Los Angeles, Calif.—\$1.5 million Navy contract for "Sonobouy" antisubmarine systems.

Eicor Div., Scranton Corp., Chicago, Ill.—\$429,070 AMC contract for alternator assemblies for C-97, C-124, T-29, KC-97, YC-97, RB-50, WB-50 and KB-50 aircraft.

Bendix Radio Div., Bendix Aviation Corp., Towson, Md.—\$2,201,747 Rome Air Materiel contract for additional AN/FPS-30 radar sets, spares, data.

Collins Radio Co., Cedar Rapids, Ia.—\$750,000 AMC letter contract for component parts for single side band radios to be used on KC-135 and B-52G aircraft.

Aircraft:

McDonnell Aircraft Corp., St. Louis, Mo.—\$136,523,635 Air Force contract for production of F-101B Voodoo aircraft.

Aircraft Accessories:

The General Tire & Rubber Co., Akron, O.—\$515,197 AMC contract for wheels, brakes, spare parts and data for F-100D & F and T-37A aircraft.

Goodyear Tire & Rubber Co., Akron, O.—\$839,586 Navy contract for main landing gear wheel assemblies for various aircraft.

Goodyear Tire & Rubber Co., Akron, O.—\$114,550 AMC contract for wheels, brakes and spare parts, installation and initial spares for F-105D aircraft.

Aircraft Components:

Fairchild Aircraft and Missiles Div., Hagerstown, Md.—\$11 million Boeing Airplane Co. contract for production of three components of the B-52G bomber.

Aircraft Emergency Equipment:

R. E. Darling Co., Bethesda, Md.—\$237,230 Navy contract for pilot's composite bailout pan

assemblies, emergency oxygen sets and disconnect assemblies.

Aircraft Instruments:

Lear, Inc.—\$3.7 million AMC contract for flight director attitude indicators and two-gyro all-attitude master reference systems for F-105 and F-106 aircraft.

Kollsman Instrument Corp., subsidiary of Standard Coil Products Co., Inc., Elmhurst, N.Y.—\$107,250 AMC contract for Type ME-4 Airspeed and Machnumber Indicators, for F-86H aircraft.

Aircraft Parts:

North American Aviation, Inc., Los Angeles, Calif.—\$150,374 Warner Robins Air Materiel contract for spare parts applicable to F-86K aircraft.

H. I. Thompson Fiber Glass Co., Los Angeles, Calif.—\$156,478 Warner Robins Air Materiel contract for spare parts applicable to B-57 aircraft.

Engines:

Lycoming Div., Avco Mfg. Corp., Stratford, Conn.—\$2,385,010 Air Force contract for continuation of the YT53-L-3 program through the engine's 150-hour qualification test.

Westinghouse Aviation Gas Turbine Div.—\$15.1 million Navy BuAer contract for continued production of J34-WE-46 jet engines to be used in T2J aircraft.

Small Aircraft Engine Dept., General Electric Co., West Lynn, Mass.—\$1¼ million Air Force contract for J85 engines for T-38 aircraft.

Engine Components:

AirResearch Div., Garrett Corp.—\$600,000 Air Force letter contract on account of an estimated \$1.5 million contract for GTU-85-2 gas turbine compressors for C-133 aircraft.

Westinghouse Aviation Gas Turbine Div.—\$5,946,563 Navy BuAer contract for jet engine parts.

Engine Accessories:

Jack & Heintz, Inc., Cleveland, O.—\$290,930 AMC contract for electric starters applicable to C-97, C-118 and C-124 aircraft.

Ground Electronics:

Admiral Corp., Chicago, Ill.—\$5,729,116 CAA contract for 39 basic conversion systems to provide daylight display of long-range radar information for air traffic control.

Collins Radio Co., Cedar Rapids, Ia.—\$3,022,147 CAA contract for equipment to provide extended radar coverage at route traffic-control centers.

Airborne Instrument Laboratories, Long Island, N.Y.—\$1,786,124 CAA contract for 10 ground traffic-control radar sets.

Ground Support Equipment:

Metal Products Div., Koppers Co., Inc., Baltimore, Md.—\$120,675 AMC contract for Type 1 semiportable noise suppressors for ground run-up.

Helicopters:

Sikorsky Aircraft Div., United Aircraft Corp., Stratford, Conn.—\$35 million Navy contract for continued production of Navy HSS-1N and Marine Corps HUS-1 helicopters.

Hiller Aircraft Corp., Palo Alto, Calif.—\$6 million Army contract for 116 H-23D Raven helicopters plus spare parts.

Vertol Aircraft Corp., Morton, Pa.—\$2,044,345 Air Force contract for six H-21 (Vertol 44A) helicopters plus spare parts, ground support equipment and handbooks.

Propellers:

Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn.—\$942,856 Navy BuAer contract for propeller equipment.

Weapon Systems:

Hughes Aircraft Co., Culver City, Calif.—\$18,874,800 AMC contract for MA-1A aircraft weapon control systems for F-106 aircraft.

AMERICAN AVIATION

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emergency floats already inflated, and floats which are normally stowed around the landing gear and can be inflated for emergency landings in seconds with a unique jet inflation system. Dependable, lightweight and simple to inflate, Air Cruisers' floats can be custom made to meet specific requirements.

The pioneer developer of flotation gear of all types for helicopters, Air Cruisers is America's most experienced fabricator of inflatables from rubberized nylon materials—the only manufacturer which conducts continuous research in survival equipment.

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JANUARY 12, 1959

Circle No. 5 on Reader Service Card.

LETTERS

On Mandatory Arbitration

Congratulations on your very excellent editorial of Dec. 15th on the current airline strike problem. I am a member of ALPA and I sincerely wish that they shared your views on when to strike and when not to strike.

Richard F. O'Neill
Minneapolis, Minn.

CONGRATULATIONS ON YOUR WONDERFUL EDITORIAL OF DECEMBER 15. OUR ASSOCIATION WILL SUPPORT AND PRESS FOR SUCH LEGISLATION STOP PLEASE SEND US 500 COPIES AND BILL US FOR SAME STOP WE ARE GOING TO USE THIS FINE ARTICLE TO SHOW OTHERS THE TIMELY NEED FOR QUICK LEGISLATION.
J. DAVIS WYNNE, SECRETARY
ARIZONA HOTEL ASSN., PHOENIX, ARIZ.

Your Personal View in the Dec. 1st issue presented the strike issue and both sides' activity very clearly.

Your Dec. 15th issue offers some constructive action—not just criticism. Mandatory arbitration seems the most realistic solution in the fact of government control vs uncontrolled unions.

Bravo for your stand in the matter, and for portraying the problems so succinctly.

A Strike-Casualty Wife

Pleased With Three-Views

Wanted to compliment you on the November 3rd issue. The finished product showed that a lot of effort had gone into its preparation. The theme gave this issue more interest than usual. Try this idea again—soon.

Today I was pleased to see that you had added a small three-view to the Aircraft Data Cards. Since I suggested this in a previous letter, I hope the reaction from other readers is also favorable.

Bobby G. Dudley, Captain, USAF
Bordentown, N. J.

Decca vs. Doppler

I have just read, with great interest, Sam Saint's October 6th column on the New York Helicopter Decca trials. I thought that this article was very fair to us and an excellent summary of the system in such a short space.

However, there is just one point on which I would like to take issue.

He says, and I quote, "For example,

Doppler, self-contained navigation system in the same sort of position, will work behind buildings, and could be made to drive a green pen across the chart to Timbuktu if necessary."

Whether Doppler will work at low altitude behind tall buildings, in the same way as Decca in the New York Helicopters, is extremely doubtful—to say the very least.

However, apart from the basic weakness of all Doppler Systems—irrespective of who makes them—is that they derive their heading information from the aircraft compass, which, as you well know, is not the most accurate of instruments.

Further, like all self-contained systems, they suffer from the handicap that the errors in any one equipment are completely random relative to any other. It is because of this no A.T.C. authority I know of will contemplate an air traffic control system, in a busy area, based solely on Doppler as the navigational aid. In other words, this "randomness" of error would have to be compensated for by much wider lateral separations between aircraft.

It is for these reasons that we have come up with our D.I.A.N. concept (Decca Integrated Air Navigator) which combines Decca, Decca (our long range system now over the North Atlantic) and Doppler. We present the information derived from any one of these on the same Flight Log display you have seen.

The combination seems ideal because you have the high accuracy and flexibility of Decca available to you in the complex areas; then Decca on the long transatlantic or translandmass routes (examples: Prestwick-Gander; Fiji-Sydney; Malta-Cyprus-Bahrain or New York-Los Angeles) and Doppler

for areas where no ground-based system is available.

A further advantage is that Doppler can provide a stand-by facility as well, and it can be continually monitored against Decca/Decca and have its cumulative error removed so that, when needed, it can be used from a basis of complete accuracy. You already know the accuracy of Decca; Pan Am has found that Decca over the Atlantic, including flights as far south as the Azores, was superior to any of the systems it checked it against. And, in fact, the Ministry of Supply Valiant Jet Bomber which carried out a detailed evaluation of Decca found that it was never in error by more than $\pm 2\frac{1}{4}$ miles.

E. (Ted) Bonner,
The Decca Navigator Co. Ltd.,
New Malden, Surrey, England

BOOKS

Aviation Engineering

Electronic Aviation Engineering. By Peter C. Sandretto. Published by International Telephone and Telegraph Corp., New York, N.Y. 772 pp. Price, \$9.50.

Webster's dictionary says aviation is the art of conducting aircraft in flight from one point to another. Navigation is for earthlings. The author has, then, confined his book to the many electronic aids for moving and positioning of aircraft. Emphasis is on the engineering principles involved. The comprehensive and detailed coverage of these aids is grouped in four classes based on the operational problems of aircraft en route to a destination airport, flight near that airport, approach and landing and movement on the airport surface.

Transport History Updated

The Air. By Edgar B. Schieldrop, D.Sc., Philosophical Library Inc., New York, N.Y. 256 pp. Price, \$12.00.

An updated and revised edition of the book originally published in 1940, it is one of four volumes written by the author encompassing the entire field of transportation. With its revisions, this book is an excellent story of man's conquest of the air. The basic principles of flight in heavier-than-air vehicles are studied, but the author does not fail in his attempt to tell vividly the story of the balloon and the airship, nor does he slight the always amazing development of the world's air transport system.

When & Where

JANUARY

Jan. 18-20—Helicopter Association of America, 11th annual convention, San Mateo, Calif.
Jan. 24-29—IAS, 27th annual meeting, Honors Night Dinner, Jan. 27. Sheraton Astor, New York, N.Y.

FEBRUARY

Feb. 4-5—National Association of State Aviation Officials, board of directors meeting, Hotel Washington, Washington, D.C.

MARCH

Mar. 5-6—IAS, flight propulsion meeting (classified), Hotel Carter, Cleveland.
Mar. 8-11—ASME, engineering meeting on "The Turbine in Action," sponsored by the Gas Turbine Division, General Electric Co., Cincinnati.
Mar. 31-Apr. 3—SAE, national aeronautic meeting, aeronautic production forum and aircraft engineering display, New York, N.Y.

APRIL

Apr. 12-15—American Association of Airport Executives, annual convention, Savannah, Ga.

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Bendix has a matchless record
in fuel metering and controls—
from the earliest developments
in carburetion for aircraft engines
to the last word in complete controls
for advanced turbine engines.
Today, this long experience
is proving to be a natural
for related problems in missile propulsion systems
—ram jets, rockets or nuclear power!

ENGINE CONTROLS

Examples of carburetors, fuel injectors, and other engine controls.

Examples of carburetors, fuel injectors, and other engine controls.



Examples of carburetors, fuel injectors, and other engine controls.



Examples of carburetors, fuel injectors, and other engine controls.



Examples of carburetors, fuel injectors, and other engine controls.

FUEL SYSTEMS

Examples of fuel systems, including carburetors, fuel injectors, and other components.

Examples of fuel systems, including carburetors, fuel injectors, and other components.



Examples of fuel systems, including carburetors, fuel injectors, and other components.



Examples of fuel systems, including carburetors, fuel injectors, and other components.



Examples of fuel systems, including carburetors, fuel injectors, and other components.

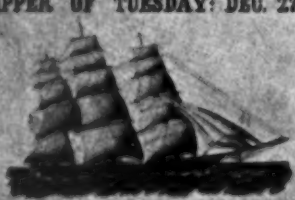
You are invited to talk it over
with Bendix engineers
who have the background
—and are anxious to share it.

BENDIX PRODUCTS DIVISION SOUTH BEND, IND.



Circle No. 6 on Reader Service Card.

COLEMAN'S CALIFORNIA LINE
SAN FRANCISCO
 SAILING REGULARLY ON ADVERTISED DAYS
 CLIPPER OF TUESDAY: DEC. 27th

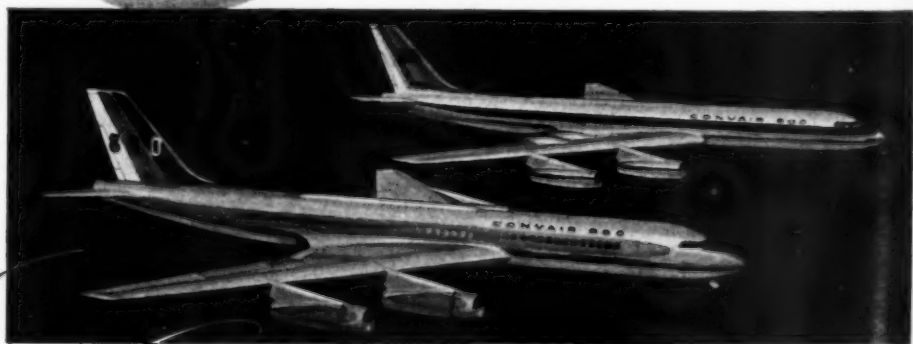


GALATEA
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 WM. T. COLEMAN & CO.
 88 WALL STREET, New York Building

Agents at the Port of San Francisco: WM. T. COLEMAN & CO.
 88 WALL STREET, New York Building
 O.E. HENNING & CO. Portland, Ore. Fred and Rose Johnson, S.F.



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CONVAIR JET-LINERS
 MASTERPIECES OF

Craftsmanship

Just as craftsmanship a century ago made American Clipper Ships masters of that era's transportation; so today Convair's traditional craftsmanship is creating masterpieces for travelers in the new jet age. Designed with precision and built to perfection in every detail, Convair's 880 and 600 Jet-Liners will be the world's fastest and most luxurious passenger planes!



A DIVISION OF GENERAL DYNAMICS CORPORATION

First to offer Convair 880 or 600 Jet-Liner service will be TWA, DELTA, TRANSCONTINENTAL (Argentina), REAL-AEROVIAS (Brazil), S.A.S., SWISSAIR, AMERICAN

Future of bombers in the mixed forces now being planned by the Air Force looks better, as successes are reported with new ballistic weapons fired from aircraft.

Chances are good that AF will order about 100 B-52Gs and 40 B-58s in fiscal 1960 with the result that about 92 more KC-135 tankers will be needed. New requirement will force the Budget Bureau to unfreeze extra funds voted by Congress to buy 15 of the big tankers which the Administration said it didn't want.

Funding for the nuclear powered aircraft will be reduced to a point which will make the dream of a hardware program impossible. Indications are that level funding of \$150 million annually will be abandoned to satisfy other needs.

Defense Secretary McElroy's concept that Advanced Research Projects Agency is a "new service" on the same level as the Army, Navy and Air Force will almost certainly be tested on Capitol Hill. Issue will be whether Mr. McElroy needs two agencies—one created by the Congress, the other created by Administration fiat to do essentially the same job. Congress can be expected to say anything ARPA can do, the new Office of Director of Research and Engineering can do better.

Big question in the Navy is: "Who will take over the functions of Assistant Secretary for Air" when the post is abolished under a planned reorganization? Congress told each of the Services to eliminate one assistant secretary but didn't specify which one would go.

MATS is supporting a drive to move more military personnel by air. AF is now moving about 90% of its person-

nel this way. Goal is 100%. Army and Navy are using airlift about 50% of time. Idea is that greater use of airlift would help the airlines and indicate value of lift as a normal not an emergency instrument of national policy. One problem is current baggage limitations which MATS wants upped.

Look for a bill to subsidize development of new cargo type aircraft to meet current military shortages in this area. Plan would be to let a government owned corporation lease the aircraft to private carriers for peacetime use. Proposal reportedly has MATS' blessing as an alternative to development of new cargo type aircraft by the military.

Place of the Army and the Air Force in the air defense program is still to be clarified. Present directives deal with administrative details and lines of authority rather than basic roles and missions which have caused the interservice rows of the past. Indications are that Congress could be "annoyed" with failure of the Administration, with all of its new authority, to eliminate interservice bickering.

State of the Union Message delivered personally by President Eisenhower on January 9th outlines steps taken to maintain technological superiority over Soviet Russia as well as the steps to be taken to narrow the lead in those cases in which Russia may be ahead. It stays conservatively, however, within the textbook concept that weapons superiority coupled with unlimited spending could permit a victory for Soviet Russia without the firing of a single shot because of the dangers of an unchecked inflation. Program is conservative with the possibility of a balanced budget, somewhat below \$80 billion, offered. Budget message is due about Jan. 19.

Aircraft accessory companies i.e. the makers of engines, communications, navigation equipment, reconnaissance, guidance and ground support equipment, as well as the makers of airframes will do about \$8 billion business annually with the Aeronautical Systems Center, according to current AMC estimates.

Times are changing with the transition to jet transports. Almost for the first time in history, aircraft are being delivered ahead of schedule. First record is made by Boeing Airplane Co. with the delivery of the last of six 707s to Pan American World Airways ahead of schedule. Manufacturers should be congratulated.

Cancellation of Fairchild's J83 contract makes it a virtual certainty that the Air Force will buy JT12s from Pratt & Whitney Aircraft Division. Production scheduling with the job of still working the bugs out of the J85 doesn't make it possible for General Electric to meet all of the requirements for small high thrust to weight ratio engines.

Cornell Aeronautical Laboratory is seeking ways and means of testing an airborne proximity warning indicator to aid in eliminating mid-air collisions, under a contract with the Federal Aviation Agency.

A new target cost system has been evolved by Northrop. It is now effective in the N-156F, counterair fighter program which the company is trying to sell to NATO countries. First production contract for the T-38 advanced supersonic trainer, a member of the same family, is for nearly \$17 million.

Convair will increase its work force at Fort Worth now that AF has made

a letter contract for 36 B-58s to be built with fiscal 1959 funds and has programmed 40 more to be funded in fiscal 1960.

Air Force may speed the decision between the McDonnell 119 and the Lockheed JetStar in the UCX competition. Idea would be to let the manufacturers use substitute engines for flight tests. Information obtained would be extrapolated against expected performance of final engines. Chances are Lockheed would use Bristol Orpheus engines now in the prototypes while McDonnell would use Westinghouse J34s.

Central air data system to be built for the North American F-108 by Garrett Corp's AiResearch Manufacturing Div. is an entirely new concept. Key is the centralized computer. Environmental information fed by the basic transducers is converted into information for the fire control, navigational, autopilot and inlet duct control systems.

Kellett Aircraft Corp., Willow Grove, is working on a new rotor blade designed to break through the current limitations on helicopter speeds. U.S. Navy's Bureau of Aeronautics has awarded a prime contract to improve blades and rotor system. Kellett is also building an agricultural helicopter.

McDonnell Aircraft has ambitious plans for the development and manufacture of transport aircraft. Robert E. Hage, formerly chief of military products preliminary design in Boeing's Transport Division, will head the brand new McDonnell Transport Division. It is now expected that McDonnell will start plans to market the Model 119 twin jet now in competition with Lockheed JetStar for military orders.

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THE UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT



News Flash! U.S. MARINE CORPS GETS LOCKHEED GV-1 HERCULES Tanker/Assault Transport



GV-1 HERCULES refueling jet fighters at NAS, Patuxent River, Maryland



Feats of Hercules No. 8

The rugged go-anywhere, haul-anything Lockheed prop-jet HERCULES will soon proudly bear the insignia of the United States Marine Corps.

Famous around the world for its prodigious Feats of Hercules, this 62-ton, 6-miles-a-minute sky giant can be converted from troop-cargo carrier to in-flight refueling tanker—by installing auxiliary fuel tanks inside the plane's huge cargo compartment, and affixing wing-attached pods containing hose-reels and drogues. In a few minutes 6,000 gallons of fuel can be pumped from the HERCULES to the "nursing" fighters.

The huge cargo compartment of the GV-1 HERCULES can carry 92 battle-ready Marines or tanks,

artillery, airfield construction equipment, big missiles, ground support equipment. It can paradrop supplies and equipment with pinpoint accuracy—and holds the world's record for the heaviest load ever parachute-extracted from a plane: 30,370 pounds. The GV-1 HERCULES can land on short, rough fields, sand, snow or ice (when ski equipped), climbs 2450 feet-per-minute, cruises at 305 knots at altitudes over 35,000 feet, for distances over 3500 nautical miles.

Making tough jobs look easy is a tradition with the U.S. Marine Corps—and the Lockheed GV-1 HERCULES has the ruggedness and dependability to uphold that tradition wherever duty calls.

LOCKHEED means leadership

Lockheed Aircraft Corporation, GEORGIA DIVISION, Marietta, Georgia

PROP-JET TROOP TRANSPORTS/AIR FREIGHTERS • JET UTILITY TRAINERS/TRANSPORTS • NUCLEAR-POWERED AIRCRAFT • NUCLEAR PRODUCTS
AIRCRAFT MODERNIZATION/MODIFICATION • GROUND HANDLING EQUIPMENT • MISSILE SUPPORT EQUIPMENT

Now It's Four Men In the Jet Cockpit

- Three-pilot concept ended Eastern's strike
- PAA is reported to be following suit
- UAL to pay engineers \$20,000 severance

By Joseph S. Murphy
Executive Editor

The first major break is emerging from a seemingly insolvable jet crew deadlock, but whether the cure will prove worse than a disease hangs in the balance.

In the most significant step in the year-long hassle, American Airlines' president C. R. Smith agreed to man AA's Boeing 707s with three pilots in addition to the flight engineer.

Although the concession hurdled many of the obstacles to the signing of a jet pilot contract by American, it fell short of averting a walkout by the carrier's 1,500 pilots paralyzing its operation during the peak year-end holiday period to the tune of \$850,000 in lost revenue a day.

Although born of the AA-pilot negotiations, the four-man crew concept proved a long-sought answer to the 38-day strike of flight engineers at Eastern Air Lines. EAL quickly signed a jet wage contract with its flight engineers, a pact with pilots on the expanded crew, then resumed operations Jan. 5 after dropping \$28.8 million in lost revenue.

Pan American, in its third month of flying jets with management crews, reportedly has agreed to the third pilot, but no announcement was forthcoming at presstime.

However significant the new crew concession, it proved little if any antidote for an increasing public and press and congressional condemnation of the holiday strikes which shut down two of the nation's "Big Four" carriers.

On the receiving end was the Air Line Pilots Assn. labeled "the economic royalists of our trade union world" in a pointed editorial in the *Washington Evening Star*. Lkening the ALPA action to the "public be damned" attitude of William H. Vanderbilt 75 years ago later outlawed by legislation, the editorial suggested "Perhaps when the public has been kicked around long enough by arrogant union action, the much-needed next legislative step (compulsory arbitration) will be taken."

The Miami News, pinpointing the

devastating impact of the Eastern tie-up on the Florida resort, carried a front-page boxscore daily on the losses to Greater Miami's economy. Its estimate: \$15,630,000 on the 37th day with the total mounting at \$570,000 daily.

American Airlines' nonflying employees, retained on the payroll an extra 16 days to bridge the holiday period, turned the tables on the pilots' union with a picket line of their own. Parading outside ALPA's Chicago headquarters, they carried banners reading "ALPA: 20,000 employees will remember you this Christmas."

American, which has become the ALPA testbed for establishing a jet pay formula, took its case to the public within two days of the walkout Dec. 20. In full page ads carried first in 16 newspapers (a day later in 25) American decried the attitude of ALPA as "selfish and arrogant."

American pegged the earnings of a senior DC-7 pilot at about \$22,000 a year, placed ALPA's demand for the jets at more than \$30 an hour. For a 1,000 hr. flying year, this would exceed \$30,000.

And although personal participation by AA president C. R. Smith and ALPA head C. N. Sayen in negotiations at NMB headquarters spurred hopes of imminent settlement, at presstime the American strike entered its third week. Less than three weeks away

was its planned launching of Electra turboprop and 707 jet service on Jan. 23 and Jan. 25, respectively.

But with the jet pay issue still unresolved, the cost of the new four-man crew remains a hazy economic factor. Today, pilots represent 7% of American's employment, but 17% of its payroll. The breach is certain to widen as a "second officer" is added to this highly paid employee category.

What impact will it have on smaller jets like the Convair 440? An ALPA spokesman had no doubts, "the 440 is even faster, it's the speed that dictates a third pilot."

In another major development, United Air Lines unceremoniously signed a contract with Flight Engineers International Association requiring that engineers on jets be pilot qualified, but with a proviso that nonpilot engineers may serve on piston types into the 1960s and then quit with \$10,000 to \$20,000 severance pay.

Engineers have until Jan. 1, 1961 to get a pilot's ticket. If the pilot's exam is not taken by then, or if failed twice, an engineer may fly piston types until Jan. 1, 1963 at which time he may elect to quit with \$20,000 severance pay.

As another alternative, he may fly piston types for their duration at United, then leave with severance pay decreasing \$2,000 a year to \$10,000 minimum.

Some Striking Statistics

(As of December 31)

Lost days of operation . . . 215

(Western 108, Capital 39, Eastern 38, TWA 18, American 12)

Lost revenues . . . at least \$70 million

(Western, \$15 million; Eastern, \$23 million; Capital, \$11 million; Trans World, \$12 million; and American, \$9 million)

Lost Wages . . . more than \$22.2 million

Settled—the pattern of mechanic and engineer payscales for jets.

Unsettled—a pilot's pay formula.

Shaping . . . a four-man crew for jets, three for turboprops

FAA Now Open for Business

With the coming of the new year 1959, has also come the beginning of a new era in air safety regulation. At 12:01 a.m. December 31, the newly created Federal Aviation Agency came into being, absorbing the 20-year-old Civil Aeronautics Administration and the safety rule making functions of the Civil Aeronautics Board.

E. R. Quesada, who helped pilot the Federal Aviation Act of 1958 through Congress, heads the new agency. James T. Pyle, administrator of the now-defunct CAA, is the FAA's deputy administrator. In addition to absorbing the 27,000-man staff of the CAA, the personnel, functions and funds of

the Airways Modernization Board were officially transferred to the FAA November 1 by Presidential Order and were designated the FAA Bureau of Research and Development. These elements, along with some military personnel and functions, form the basis for the new agency.

Transition of FAA from Congressional authorization to an agency in being has been carefully planned by Quesada and his staff so that there would be a minimum of disruption of essential services performed by the different parts of the new agency. Air traffic control, the government's extensive air safety program, the installation of air navigation facilities, equipment procurement, rule making, and the many other federal functions have made the transition into FAA without interruption.

In addition to the CAA's basic duties, the rule making of the CAB, and the functions of the Bureau of Research and Development, the FAA will have expanded enforcement responsibilities and complete control over the national airspace. This includes authority over designation of airspace reservations for both military and civilian interest. The FAA also has authority to investigate accidents involving aircraft of 12,500 pounds weight or less, under a delegation from the CAB. Determination of probable cause remains with the CAB.

Budget-wise, about \$365,000,000 previously appropriated for CAA operations and \$120,000 from CAB funds have been transferred to FAA. In addition, FAA is taking over a number of important military air traffic functions under the provisions of the basic act. FAA staff is expected to total about 28,000. Of these, about 135 will be military personnel assigned to the agency from the Department of Defense.

FAA will have its headquarters in a completely renovated building at 1711 New York Avenue, N.W., in Washington. The refurbished building—a former hospital—will house about 550 people and has approximately 80,000 square feet of usable space. First FAA staffers will move in this month.

Pyle and Quesada earlier this month held a quote "change-of-command" ceremony for some 1,500 Washington employees of the now-defunct CAA, who had been transferred to the FAA. Quesada—"Our new boss"—was given a warm-hearted introduction by Pyle, and in turn stressed the opportunities available in FAA for the ex-CAA workers. All of the CAA work will

continue, Quesada said. At the end of his 15-minute pep talk, Quesada asked all present to join him in a standing tribute to Pyle, who had shown "the highest quality of leadership and devotion to public duty" while head of CAA.

The Staff Thus Far



E. R. QUESADA
Administrator



JAMES T. PYLE
Deputy
Administrator



GORDON BENNETT
Special Assistant to
the Administrator



JOHN R. MAC KENZIE
Chief, Office of
Legislative Liaison



WILLIAM B. DAVIS
Director, Bureau of
Flight Standards



ALAN L. DEAN
Assistant
Administrator



DAVID D. THOMAS
Director, Bureau of
Traffic Management

The Organization

ADMINISTRATOR AND DEPUTY ADMINISTRATOR

General Counsel, Office of General Counsel
Regulation & Legislation
General Legal Services
Enforcement

Civil Air Surgeon, Office of Civil Air Surgeon
Chief, Office of Legislative Liaison
Chief, Office of Public Affairs
Public Affairs
Publications
Audio-Visuals

Chief, Office of International Coordination
International Organizations
Technical Assistance

Asst. Administrator, Office of Management Services
Programs & Budgets
Accounting
Management Analysis
General Services

Asst. Administrator, Office of Plans and Requirements
Aviation Policy
Aviation Economics
Aviation Statistics
Mobilization Plans
Radio Frequency Management

Asst. Administrator, Office of Personnel and Training
Personnel
Recruitment & Placement
Military Personnel
Classification & Wage
Security
Relations & Welfare
Training
Requirements
Curricula
School Operations
Administration & Management Training

Director, Bureau of Research & Development
Operations Analysis
Systems Analysis
Systems Experimentation
Development
N.A.F.E.C.

Director, Bureau of Flight Standards
Engineering & Manufacturing
Aircraft Operations
Aircraft Maintenance
Records: Certification & Registration

Director, Bureau of Facilities
Equipment Installation
Plant Construction
Maintenance
Materiel
Airports

Director, Bureau of Air Traffic Management
En route & Terminal Operations
Communications & Weather
Airspace Utilization
Systems & Procedures

Bombers Ain't Dead

Missile firing from B-58
soars interest and money

In mid-December Air Force fired a two-stage ballistic weapon from a B-47 traveling at subsonic speed. A day or two later it fired a single stage ballistic weapon from a B-58 traveling at supersonic speed.

Result is a new interest in the manned bomber, whose demise was being freely predicted only a few short months ago. This new interest will not show up in the fiscal 1960 budget when President Eisenhower is expected to ask for \$1.5 billion to \$2 billion to buy about 100 B-52G bombers, 40 B-58s and provide important development funding for the B-70 chemical bomber.

How much the picture has changed already is indicated by the story of planned funding for the B-52. In the original fiscal 1959 budget, there was no planned funding for the B-52. Later, President Eisenhower requested and received funds for 39 more bombers, just enough to protect reorder leadtime and keep the production lines moving.

Now that the decision has been made that bombers can continue to do their job for the foreseeable future, you can expect to see an even more dramatic shift in the product mix.

Planners say it's basically a matter of economics. The aircraft provides a versatility which makes it useful in either a big or a little war, thus making it less necessary to maintain a dual force—one to handle big wars, the other to handle small ones. They also say that the aircraft, now that it's sure that every flight won't be a suicide flight, can provide the intelligence needed to handle unpredictable contingencies, including an order to return or diversion to a new target.

Captain's "Technique" Hit In New Haven Accident

Civil Aeronautics Board has determined that "the improper technique of the captain resulting in the unintentional retraction of the landing gear prior to V_1 speed" was the cause of an accident during takeoff at New Haven, Conn. last March.

Since the premature retraction was made possible by a malfunctioning left gear safety switch on the American Airlines Convair 240, CAB cited inadequate inspection by the carrier as a contributing factor.

During the investigation, the captain stated that, before reaching V_1 speed in the takeoff roll, he observed a fire in the vicinity of the left en-

gine. He claimed that he heard and saw the fire warnings, and decided to abort the takeoff and scuttle the aircraft to bring it to a quick stop.

However, the CAB investigation disclosed "clear and substantiated" evidence that the engine did not catch fire until after the aircraft settled. Claiming that the captain's testimony was inconsistent with this evidence, the Board stated that "poor piloting technique was displayed by the captain in placing and keeping his hand on the landing gear selector handle and by his uncalled for action in applying an upward pressure on this lever in anticipation of the first officer's command to raise the gear."

On this flight, the captain, though occupying the left seat, was acting as first officer while the latter made the takeoff.

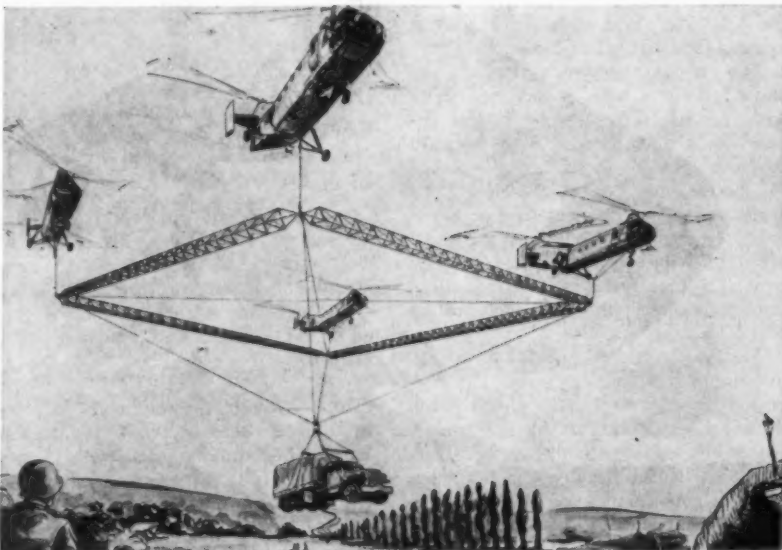
As a result of this accident, American Airlines restricted the captain from

flying as pilot in command for a period of six months and took immediate steps to prevent further instances of landing gear safety switch malfunction.

Choice of AEW Source Near, Next Stop: Air Council

Source Selection Board has finished its work on the early warning aircraft and control system. Next step will be to take the recommendations to the Air Council which will make the final report to Air Secretary James H. Douglas.

Companies which have submitted proposals include: Boeing Airplane Company whose plan is based on a pure jet, Convair Division of General Dynamic with Canadair, Lockheed Aircraft Corp., Douglas Aircraft Co., Hughes Aircraft and RCA. Many of the proposals are "team" arrangements.



Team Concept Would Give Helicopters Broader Utility

Helicopters harnessed in teams may provide an answer to the Army's need for a high-lift workhorse. Rather than invest money to develop a special-purpose crane-type helicopter, the Army has let a \$250,000 contract for Vertol Aircraft Corp. to perfect the multi-lift system.

By this method, ordinary helicopters working in teams of two to six could perform necessary heavy-duty work and then return to normal service. Sketch above is one possibility—four H-21s hoisting a 13,000-lb. 6 x 6 cargo truck.

Basic component of the hitch harness is the aluminum alloy spreader frame designed by Vertol to maintain

distance between helicopters. Each 113-ft., 400-lb. frame is connected to the helicopters by 10-ft. suspension cables.

Close coordination between team members is provided by radio contact, with a command pilot in the rear-most helicopter directing changes in heading, speed, and altitude. An electrical release enables any pilot to uncouple all members of the team in case of emergency and for normal unloading.

Vertol's flight program will include testing of two, three, and four helicopters in hitch arrangements, as well as the best methods of frame assembly, ground handling, and ground/air coordination.

JANUARY 12, 1959

19

What Price Mach 3? And What's It Worth If You Can Afford It?

If anyone wants to buy a supersonic jet transport in 1970, he can expect to shell out \$35 million for it.

According to a recent Rand Corp. study, this is what the cost of a complete flying unit "out the door" might be. Under the circumstances, the only possible customer initially would be the Air Force. But the decision would have to be based on how improved performance would permit reduction of existing fleets.

Here's how the same study compares estimated performance of the Mach 2 and 3 transports with slower types flying today.

It assumes four theoretical aircraft. One is a Mach .6 advanced turboprop "something like the C-133." Second aircraft is a Mach .85 turbojet resembling the KC-135. Third and fourth aircraft are designed for Mach 2 and 3.

The two supersonic aircraft are canard designs with a modified delta wing far aft. The aircraft bodies appear long and narrow with forward surfaces located about one-quarter of the body length aft of the nose. Tail surfaces may be conventional or eliminated entirely. Both designs incorporate thin wings of about 2½% ratio as well as high finess ratio shapes. Both configurations will have high cruise Reynolds numbers.

Mach 2 aircraft would have all-aluminum structure. Titanium and corrosion-resistant steel make up the Mach 3 model. Both aircraft have relatively low wing loading. Sandwich construction also figures heavily.

Base performance of the four aircraft is established at 2,500 n.mi. range and 50,000-lb. payloads. Fuel reserve is assumed at 10%.

With these requirements, performance for the four aircraft may be projected as follows:

	Mach .6	Mach .85	Mach 2	Mach 3
Cruise Speed (knots)	345	490	1,150	1,720
Block Speed (knots)	320	455	995	1,305
T/O Wt. (lb.)	152,000	240,000	285,000	260,000
T/O Run (ft.)	3,888	4,600	6,000	5,500
Initial Cruise Alt. (ft.)	35,000	40,000	53,000	65,000

No powerplant details have been given. However, if advanced conventional turbojets are used, partial afterburner operation would be necessary at cruise speeds for the Mach 3 aircraft.

There will be sizeable noise increases as the afterburner is used for takeoff. Shock waves generated by large Mach 2 and 3 transports may have ground

effects hard to predict by present day experience. If these items, or others, result in flight operation restrictions, flexibility and economy of the transports would be seriously hampered.

High fuel consumption will limit holding times to about half that of current transports. An almost straight-in approach will be required. With short coast-to-coast flight times of approximately two hours, it may be possible to obtain landing clearance prior to takeoff. If delays are anticipated, passengers could be retained in a comfortable terminal area until destination clearance is received. Such a system requires improved communications networks with almost instantaneous trans-

Range (n.mi.)	Turboprop		Subsonic jet	
	NDT*	10 min.	NDT*	10 min.
500	250	238	410	360
1,000	310	248	445	405
1,500	315	305	455	430
2,000	320	310	455	455
2,500	320	315	455	450
3,000	320	318	455	452
3,500	320	319	455	453

* NDT—No Dead Time.

... News Briefs

• **Hughes Aircraft Co.** reports that the increase in 1958 sales, up to nearly \$500 million, is attributable to new defense-connected projects, including MA-1 airborne integrated control systems, 3-D radar and machine tool controls.

• **Rohr Aircraft Corp.** intends to offer for public sale 300,000 additional shares of common stock with a par value of \$1.00. Proceeds of the sale, which will be handled by The First Boston Corp., are to be used to reduce short-term bank loans and to increase working capital according to a statement filed with the Securities and Exchange Commission.

• **Convair-Ft. Worth** will conduct research on the use of titanium in sandwich construction under a contract received from the Air Force. Alloys and development of production methods will be studied as well as processes and tooling.

• **Republic Aviation** has opened an office at 8921 Sepulveda Blvd., Los Angeles. Functions will be to establish closer liaison with West Coast manufacturers and military agencies. Edward J. Flynn will be manager.

• **General Motors Corp.** has denied willful guilt in overcharging the gov-

missions to all aircraft destined for each airport. Large control areas which restrict flight speeds at low altitudes pose a problem of adequate visibility because of the high angle of attack required at low speeds in supersonic aircraft.

Takeoff, climb and acceleration on a N.Y.-Paris flight would consume about 30% of the total fuel. Economy would be good after attainment of proper altitude and speed. Block speed drops off rapidly as range is reduced.

The following table shows the effect of 10 minutes "dead time" on block speed. At 3,500 n.mi. there is little effect on the turboprop and subsonic turbojet, but block speed for the supersonic transports is reduced.

Although the values in this table are only guestimates, it appears obvious that supersonic transports are not suited for ranges under 1,000 n.mi. If flown on short distances, they should not be pushed to supersonic speeds.

Mach 2 type	Mach 3 type	
	NDT*	10 min.
840	650	...
980	850	1,120
1,020	900	1,300
1,060	930	1,380
1,085	995	1,425
1,100	1,010	1,475
1,125	1,045	1,500

ernment for jet engines but has agreed to return \$9,908,000. Company said it is settling on a payment based on the difference between actual and estimated costs.

• **Curtiss-Wright-Link Aviation** fight over patent infringements has gone to the Federal Court in Utica, N.Y. C-W charges Link has violated four patents based on inventions of Dr. Richard C. Dehmel of its Electronics Division.

• **Douglas Aircraft Co.** president Donald W. Douglas, Jr., foresees no bright spot in the immediate future for sales of additional commercial or military jet aircraft. Some 900 jets for commercial users are now on order from U.S. and European manufacturers. He predicts that industry employment, which declined from 982,000 to 743,000 last year, will level off at about 750,000.

• **Northrop Aircraft's** new T-38 USAF trainer has been dubbed "Talon."

• **Contracts involving government-owned machine tools** will be the focus of a new investigation by the General Accounting Office. Recommendation has been made by the Joint Committee of Defense Production to see that no contractor is basking in an "undue competitive advantage."

DEFENSE ANGLES

by Betty Oswald

• **Fairchild Engine and Airplane Corp.** has finally been given the word by the Air Force that the much predicted cancellation of development of the J83 engine is true. Contract has been wiped out for several reasons. Immediate effect will be the layoff of more than 2,000 workers.

• **National Aeronautical Establishment** has been set up by Canada's National Research Council. Division is to work with the Defense Research Board on various problems and will be responsible for research on the aerodynamic and structural needs of civil aviation and the commercial aircraft industry.

• **The first of five Brantley YHO-3** helicopters ordered by the Army for evaluation purposes is scheduled to be delivered this month. It is a military version of the civil model B-2.

• **North American Aviation-owned** Reno Sky Ranch, part of acreage bought by NAA two years ago, has been released without charge to the USAF for use as a temporary base for the transition phase of a helicopter training school.

• **Lockheed Air Terminal** has negotiated a contract for fueling at Chicago's O'Hare Field, making the fourth airport fueling operation to be handled by LAT. Both jet and aviation fuel will be pumped and the yearly estimate is 600 million gallons.

• **Manufacturers will discuss** new government regulations on patents, proprietary data and cost reimbursement on January 15 at Los Angeles.

• **Highly mobile air transportable communications center** has been developed by the U.S. Army to help direct fast moving ground forces. The system can be readily moved about by helicopter.

• **Bristol Aero Engines, Ltd., and Armstrong Siddeley Motors** are merging into a single operating company. The two have been working together as Bristol-Siddeley Engines, Ltd.

• **Pratt & Whitney Aircraft Division's** little JT-12 engine will definitely be used in North American Aviation's T-39. Contract for production of the plane which won the utility trainer competition is now in the final stages of negotiation.

• **Fairchild Camera and Instrument Corp.** is entering the digital magnetic tape handling field through the purchase of the Digitronics Corp., Albertson, N.Y.

Interservice warfare over the roles each will play in the air can be expected to continue unless either the Defense Department or the Congress puts its foot down hard. Functions papers signed by Defense Secretary Neil H. McElroy admittedly have done nothing to eliminate long standing confusion and bickering.

Trouble starts with the provision that the Army shall have such air and water transport as is "organic" to its units. There is no attempt to define "organic" in the new paper. Instead, there is the reference back to a directive signed by the then Defense Secretary Charles E. Wilson on Nov. 26, 1956, which limited the size and range of Army aircraft as well as the purpose for which they might be used. This the Army has always fought.

What is more serious, however, is the situation with respect to air defense. Army is given the authority by Directive 5158.1 "to organize, train and equip Army air defense units" Air Force is given the authority "to develop doctrines and procedures, in coordination with the other Services, for the unified defense of the United States against air attack."

It is also given the even broader authority in the same document "to develop, in coordination with the other Services, doctrines, procedures and equipment for air defense from land areas, including the continental United States." This would seemingly leave the Army out of the business of developing new air defense equipment or doctrine.

Still another seed of dissension exists with respect to strategic warfare. Strategic Air Command has, of course, become a specified command subject to the control of the Secretary of Defense and the Joint Chiefs of Staff. Question being asked is: "What about the Polaris submarine?" It's a strategic deterrent, concededly. "Is there any possibility that Polaris submarine units might ultimately be made a part of SAC? If so what about Navy long range sea based attack planes?"

Congress may well say as a re-

sult, that something was accomplished but little done when the Reorganization Act became law. It will recall that a major factor in the sales campaign for the reorganization was the elimination of interservice rivalry and bitterness.

Actually, the only place where the effort to provide unified development of new equipment and techniques shows up is in the reorganization of the Joint Chiefs of Staff. Here, both Army and Navy representatives are included in the SAC branch of the Long Range Atomic Operations Division, which is a part of the Operations Directorate of the JCS.

And there are other signs of a new try at unification at the JCS level.

Trouble may be averted, according to some Pentagon sources, only if the new Director of Research and Engineering, Dr. Herbert York, deals with a firm hand in recommending or determining what projects each of the three Services will be allowed to develop or if the fiscal strings are pulled tight by Mr. McElroy.

However, Dr. York can be expected to have his own hands full. The same functions paper which spells out Army, Navy and Air Force responsibility makes his office that of chief advisor to the Defense Secretary in all research and engineering matters. The paper ignores the Advanced Research Projects Agency.

However, we have it on the word of both Defense Secretary McElroy and his Deputy Donald A. Quarles that ARPA will be continued as an "operating arm or agency of the Secretary." Both ARPA and Dr. York have about the same powers, the first by order of Mr. McElroy, and the second being provided by statute.

Dr. York and Roy Johnson, ARPA chief, have proved they can work together. Nevertheless it has long been axiomatic at the Pentagon that when one agency can do the work of two trouble is bound to follow. Important in this regard is the fact that Mr. Johnson reports not to Dr. York but to Defense Secretary McElroy. What all this adds up to will be well worth watching.

SCAT Takes the Guesswork Out of Takeoffs

By George Hart
Technical Editor

One of the last areas of "seat-of-the-pants" flying is on the way out.

The problem heretofore: The lack of an adequate instrumentation system to lead a pilot through the correct take-off and climb regime.

The result heretofore: An airplane—particularly a heavy jet—could be flown into the ground without the pilot being informed of what he was doing.

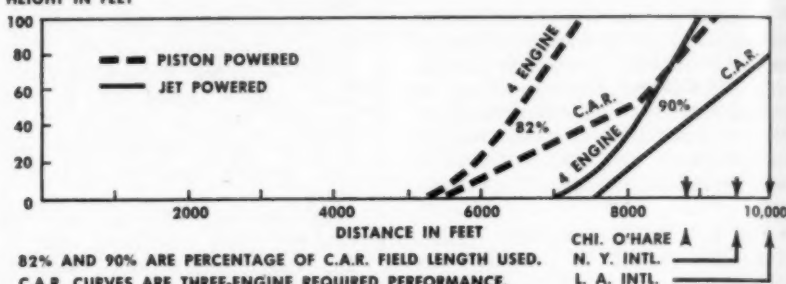
Now, there is SCAT (Speed Control and Takeoff). Announced by Dr Leonard M. Greene, president of Safe Flight Instrument Corp., White Plains, N.Y., SCAT is a takeoff monitor—not a go/no-go device—based on the company's existing speed control system.

Here's what it does:

- Tells the pilot when he's at the proper nose rotation speed.
- Guides the pilot in applying proper stick force.
- Helps the pilot select the proper climbout flight path.
- Permits maximum use of payload capability.

The first demand placed on a pilot making a jet takeoff is that he should recognize attainment of nose rotation speed (V_R) more accurately than ever.

HEIGHT IN FEET



82% AND 90% ARE PERCENTAGE OF C.A.R. FIELD LENGTH USED. C.A.R. CURVES ARE THREE-ENGINE REQUIRED PERFORMANCE.

HERE'S WHY SCAT'S IMPORTANT TO JETS. The fully loaded piston-engine transport attains minimum flying speed 2,700 ft. down the runway. It reaches V_R speed 13 seconds later and passes through 50 ft. altitude traveling at 211 ft./sec. The jet transport moving at 264 ft./sec. as it passes through 35 ft. (the new altitude clearance for this type of aircraft), takes only five seconds to get from minimum flying speed to V_R .

For every knot over true V_R speed that the nose is rotated, the airport boundary may be crossed 13 ft. lower than if the nose had been rotated at the correct V_R speed. If the pilot rotates and breaks ground at too slow a speed, initial rate of climb will be greatly reduced, leaving correspondingly less margin for climbout errors.

In addition, stick force is a most important factor at this point in the takeoff.

If 60-lbs. force is right for a given

set of circumstances, application of only 50 lbs. will make the climbout flight path much too shallow. Apply 70 lbs., and G forces will bring the wings close to stalling again.

In terms of economy, an error of one knot in recognition of V_R speed is equivalent to approximately 2,000 lbs. of payload. In other words, if an operator had to allow for a tolerance of four knots in recognition of V_R speed, he would lose 8,000 lbs. of payload. If he could rely upon recognition with-

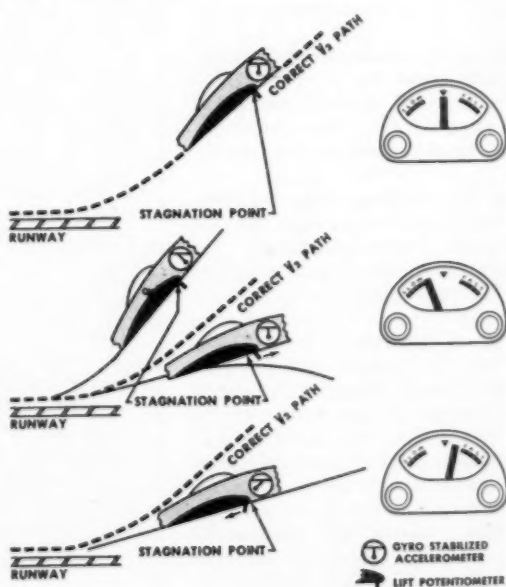
Here's How SCAT Works

A small vane protruding from the underside of the wing leading edge at approx. 2% chord vane senses pressure at the stagnation point. As the wing approaches the stall, the reversed airflow ahead of the aft-moving stagnation point tips the vane forward. As speed increases, the stagnation point moves forward and the vane is tipped aft.

This vane forms part of a "lift potentiometer" which transmits a signal through a computer to an indicator which may be mounted on the glare shield in the cockpit. By adjustment at the computer, the indicator pointer is set so that it is centered when the aircraft is being flown at the correct percentage of stall speed for the approach.

In a few installations, it's necessary to install a flap position potentiometer to allow for the effect of flaps.

To complete the takeoff part of the system, Safe Flight has added a gyro-stabilized accelerometer which is electrically connected in series with the potentiometer signals. Thus, forward acceleration moves the pointer towards the "Fast" mark to call for nose up rotation, and deceleration moves it towards the "Slow" mark calling for other appropriate corrective action.



in two knots, he could put 4,000 lbs. back on.

But how can a pilot be this accurate in distinguishing the correct V_x speed? He can work it out from the flight manuals in advance, but wing loading, flap setting, ground effect, thrust, take-off delays, pilot alertness, etc., all combine to affect performance. And they are never the same from one takeoff to the next. This is not a completely satisfactory basis for establishing V_x speed.

As for elevator control, show a pilot a photograph of the instrument panel of an aircraft just airborne, and ask him to say immediately what he should be doing to maintain a proper flight condition. Perhaps he'll respond that he must pick up a wing or stop a slight turn. There are instruments on the panel to alert him to such conditions. But there has been no single instrument on the panel accurate enough to tell him in a fraction of a second what he should be doing with the elevators. And here it's worth noting that the big transport can climb or descend equally smoothly with a $12\frac{1}{2}^\circ$ nose up indication on the gyro horizon.

• **And after rotation**—Even if the pilot

does happen to rotate at just the right point and in the right manner, he's still confronted with the problem of flying an accurate climbout flight path. If the piston-powered transport is climbed out at 17 kts. below V_x speed, rate of climb is cut from 1,200 ft./min. to 1,100 ft./min. The typical jet's rate of climb will be cut by the same 100 ft./min. with a reduction of only three knots below V_x . To carry things a step further, if the jet is climbed out at 17 kts. below V_x , rate of climb will drop below zero.

Accelerating during the climbout is equally detrimental to performance. Acceleration of one knot per second can result in a reduction of over 600 ft./min. in the rate of climb.

• **Here's how it's done**—Demonstrating the SCAT system, Safe Flight's chief test pilot, Chuck Baldwin, points out that his own preference for optimum performed is to initiate rotation at about 95% of V_x speed as read on the airspeed indicator. At this point, he disregards the airspeed indicator, and concentrates on the SCAT indicator and the runway ahead of it. Keeping the pointer centered, he transitions V_x smoothly and climbs out at an ac-

curate V_x speed—the system takes into account all the variables involved.

Elimination of ground effect, changes in power setting, effect of raising landing gear, etc. are apparent immediately. By applying elevator control in accordance with the commands of the SCAT pointer, the optimum climbout flight path for any set of conditions is established automatically.

Though some pilots may deny this, there are many who will agree with Dr. Greene when he says that the takeoff phase of flight has reached the point where a machine can do a more accurate job of work than a man. And he points out that it's perfectly feasible to hook SCAT into the elevator control circuit of an automatic pilot. This, he feels, will ensure even more precision during takeoff and climbout.

At present, SCAT is undergoing evaluation in a Douglas DC-8, and the system is scheduled for test installation in several military aircraft. Since the system incorporates most of the ingredients necessary for one form of go/no-go device, it's possible the next step will be to add this capability. In the meantime, Safe Flight feels the SCAT system enables the pilot to get the most out of what he's got.

First Details on Sud Aviation's SE 3200

Sud Aviation's Model SE 3200 helicopter, now undergoing ground tests, will have a speed up to 130 kts. and maximum gross weight near 17,000 lbs. Power is supplied by three 750-hp Turbomeca TURMO III free-shaft turbines driving a four-blade metal rotor.

Use of the free-shaft means no

clutch is necessary. Transmission shafts connect the front and rear turbines to the main gear box by means of free wheels. Power from each engine is transmitted separately.

Lateral stubs carry two 792-gal. drop tanks which can be replaced on shorter missions by 396-gal. units. This same

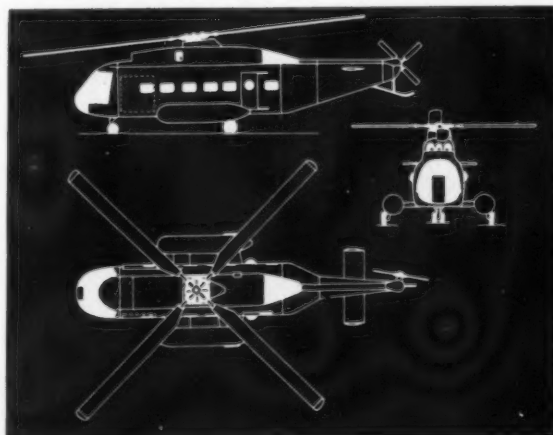
stub structure mounts the main landing gear and full-castering dual nose wheel. The gear is designed to sustain impact loads corresponding to a rate of descent of 600 fpm.

The reinforced cabin floor and folding tail boom allow loading of heavy cargo into the 862.5 cu. ft. hold.

Sud Aviation SE 3200 Specifications

Gross Weight:	
Military	16,530 lbs.
Civil	15,650 lbs.
Overload	17,640 lbs.
Empty Weight	9,900 lbs. ¹
Performance:	
Sea Level Cruise Speed	102-124 kts.
Max. Speed	110-130 kts.
Service Ceiling	9,840 ft. ²
Range	184 n.m. ³
Endurance	3½ hrs. ⁴
Cruise Fuel Consumption (Sea Level)	1120 lbs./hr. ¹
Dimensions:	
Overall Length	47 ft. 6¾ in.
Width	17 ft. 47/64 in.
Height	14 ft. 5½ in.
Cabin	6 ft. x 6 ft. 3 in. x 25 ft.
Main Rotor Diam.	49 ft. 2 9/16 in.

¹Approximate. ²At military gross weight. ³At 108 kt. in civil configuration. ⁴Hovering out of ground effect.





A/F/C

by



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LEAR

CP-34

FULLY TRANSISTORIZED
CAA APPROVED — ARINC COMPATIBILITY

Taxi Radar Gets \$1,786,124 Go-Ahead

A long-overdue shot in the arm is finally in store for airports plagued with problems of ground traffic management.

As one of its last official acts before assuming the label FAA, CAA ordered \$1,786,124 worth of taxi radars and earmarked them for 10 major airports. Winner of the award was Airborne Instruments Laboratory, a division of Cutler-Hammer, Inc. of Mineola, N.Y.

The new radars, officially identified as airport surface detection equipment (ASDE), will go to New York (Idlewild), Newark, Washington National and Chantilly, Los Angeles, San Francisco, Seattle-Tacoma, Cleveland, Chicago-O'Hare, and Boston. Delivery is expected to begin in 18 months (about mid-1960).

ASDE, outwardly recognizable by a ball-shaped polyethylene-coated Dacron bag perched atop control towers, gives traffic controllers the same "electronic" visibility in ground operations that they have enjoyed from radar for air traffic for more than 10 years.

A prototype engineering model of ASDE installed at New York's Idlewild airport (see cover photo) has been in service for six months (A/A July 14, p. 22). It will be replaced with a production model under the new program.

Within the plastic-coated balloon, ASDE's antenna scans the airport once every second, pinpoints all airport surface traffic on a 16-in. diameter scope in the control tower. Operating at 24,000 mc and using the narrowest

beamwidth (.25°) employed by radar, ASDE will show a separate ground target for two objects only 10 feet apart, according to AIL officials.

Although the initial CAA order covers only 10 units, all indications are that the program will be extended far beyond that figure.

For one, the 10-unit order erases once and for all the threat that the ASDE program would be researched to death and never move from laboratory to production. And despite outspoken endorsement of its merits by airport authorities over the past 10 years of its development, taxi radar unfortunately won a low-priority rating in all quarters, a situation that can be expected to change radically under an increasingly airport-conscious Federal Aviation Agency.

Big Changes for AOC New dues structure, budget upped, D.C. staff doubled

Airport Operators Council membership has voted 6-to-1 favoring an expansion program that will hike its annual budget, more than double its Washington staff and drastically overhaul its dues structure and services to attract new members.

Detailed planning to implement the new program will be undertaken at an AOC board of directors meeting in Washington Jan. 13-14. It is based on recommendations of a four-man committee made up of George De-

Ment (Chicago); Clarence Carlander (Seattle); Ron. M. White (Kansas City); and, David G. Davis (Denver).

In the first significant change in AOC's organization since its formation in 1948, a revamped dues structure will boost the group's budget from \$50,000 to \$85,000 annually. Instead of the flat \$1,000 fee charged in the past, the dues drops to a low of \$250 for members representing small traffic hubs, \$500 for medium hub members and \$700 for large hub members.

In addition to these basic rates, there will be an additional charge of \$2 per 1,000 enplaned passengers up to one million; \$1 per 1,000 between one and two million; and, 50¢ per 1,000 over two million.

Using CAA's classification of traffic hubs and 1957 traffic figures, AOC estimates that dues would range from \$294 to \$466 for small hubs; \$722 to \$1,260 for medium; and \$1,660 to \$5,562 for large hubs.

Equally drastic is AOC's new Washington reorganization to expand its services. Instead of an executive director post now held by E. Thomas Burnard, an executive vice president would head up staff operations. Reporting to him will be three directors, for management services, finance and economics, and technical services.

The titles of the three directors provide the key to AOC's expanded services to membership, to be concentrated in the areas of management, economics and technical matters. Burnard told AMERICAN AVIATION that AOC is moving ahead with plans to fill the posts promptly, is already interviewing prospects.

... Airport Briefs

• **Industries for Jefferson County (Colo.), Inc.**, a semipublic agency, has drawn preliminary plans for a \$1 million county airport to serve general aviation. As proposed, the federal government would contribute up to 53.18% of the total cost if final plans are approved by FAA.

• **Birmingham (Ala.) Municipal Airport** has completed preliminary plans for expansion of its terminal building at an estimated cost of \$900,000.

• **Denver, Colo.**, expects to improve Stapleton Field now that the Air Force has abandoned plans for a nuclear airplane engine laboratory at Rocky Mountain Arsenal. AF plans have been blocking acquisition of arsenal land needed for extension of the N/S runway to 12,000 ft. to meet commercial jet requirements.

Miami Readies for the Jet Age With a Huge New Terminal



City of Miami News Bureau Photo

ALTHOUGH MIAMI'S NEW INTERNATIONAL AIRPORT will not go into full operation until sometime this month and dedication will not be until February 1, passengers began to file through the huge new terminal on December 15. The architect's rendering gives a view of main terminal building with its five fingers stretching out onto the ramp. The building is known as the 20th Street Terminal. Airport cost \$26 million.

Foreign Firms Steal Lead in Turbine Sales

With the coming of turbines, foreign manufacturers are nibbling away at the U.S. business flying market—particularly in the powerplant field.

Although only nine turbine-powered executive aircraft were delivered to U.S. customers in 1957-1958—three Vickers Viscounts, one Morane-Saulnier MS 760, four Sud Aviation Alouette helicopters and one Fairchild F-27 Friendship—only the F-27 is American-built. And that is powered by British engines.

Similarly, when Fairchild delivers 16 other F-27s it has on order and Grumman ships the 27 Gulfstreams it has sold, all will be powered by British Rolls-Royce turboprops.

In addition, D. Napier & Son Ltd., another British engine manufacturer, is beginning to establish itself in the U.S.

Large numbers of Convair 340/440 twin-engine transports are gradually being taken over from the airlines by private corporations, and Napier is offering to re-engine them with Eland turboprops. Nearly two hundred such aircraft are operational in the U.S. (approximately 30 are already corporation-owned) which gives the engine manufacturer a good potential. The only competitive threat to Napier comes from Allison Div. of General Motors which has a similar conversion program for Convairs using Allison 501-D13 turboprops—the same type powerplants as used on the Lockheed Electra.

On the pure jet side, Lockheed Aircraft Corp. recently announced that it was putting the JetStar into production and has allotted about 70 production line places to corporate buyers. A variety of powerplants is being offered, one of which is again British—the Bristol Orpheus.

France too has started to make inroads with its Sud Aviation Alouette and Djinn helicopters and Morane Saulnier MS 760 Paris—four-place executive jet transport.

But a slightly different approach has been used in this case. Republic Aviation Corp. has signed a licensing agreement with Sud Aviation whereby the American company will build both helicopters if enough orders are forthcoming. All models delivered to date are French-built.

A similar agreement has been reached between Morane Saulnier and Beech Aircraft Corp.

In the case of piston-engine business

aircraft, foreign manufacturers have had a hard time competing except in specialized categories. Canada, for example, has specialized in "bush" type aircraft. In this they have practically no competition. For several years de Havilland Aircraft of Canada Ltd. has been manufacturing DHC-2 Beavers and DHC-3 Otters—both single-engine utility aircraft able to get in and out of rough strips with heavy loads.

... Business Flying Briefs

• **De Havilland Aircraft of Canada Ltd.** expects both U.S. and Canadian certification for the DHC-4 Caribou shortly. Several major U.S. oil companies are reported interested in the aircraft for oil exploration in South America. Price of the commercial Caribou is \$495,000 less radio and interior furnishings.

• **Forney Aircraft Co.,** Fort Collins, Colo. has stepped up production of its two-place all-metal lightplane, known as the Fornaire, to one a day. Aircraft is basically a refined version of the well-known Ercoupe.

• **Commercial Aviation Acceptance Corp.,** Chicago, Ill., a subsidiary of Commercial Discount Corp. has been formed to finance new and used aircraft. To date, 23 large dealers and distributors of Beech, Cessna, Piper, Mooney and Aero Commander aircraft have signed up for the financing services.

• **Air Oasis Co.,** Long Beach, Calif., distributors of Cessna aircraft and Continental engines, are building a \$250,000 commercial aircraft center at the Municipal Airport. Scheduled for completion by March 1, it will be capable of servicing all types of business aircraft. Structures to be erected include a hangar facility, general offices and a display room.

• **Cubana Airlines** has built a prototype four-place helicopter designated C-58 which it plans to put into production and sell for about \$10,000. Powered with a 260 hp. engine, the helicopter has a gross weight of 3,000 lbs. Maximum altitude is given as 10,000 ft.; max. speed 120 mph; cruising radius 100 miles.

• **Lockheed Aircraft Corp.** and Mexican interests have formed a commercial aircraft manufacturing company in Mexico known as Lockheed-Azcarate,

Britain's de Havilland Aircraft Co. Ltd. has competed directly with American business aircraft manufacturers with its twin-engine DH-104 Dove. To date approximately 80 have been sold to U.S. operators.

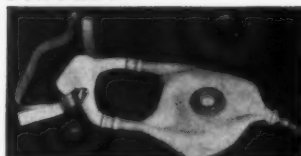
A slightly larger four-engine version known as the DH-114 Heron has met with limited success and only three are believed to be used by U.S. operators.

S.A. First product of the new company will be a utility lightplane. Lockheed's Georgia Division will supply design prototypes and tooling.

• **Northern Aircraft, Inc.,** Alexandria, Minn., has changed its name to Downer Aircraft Industries, Inc.

• **Navion Division of Tusco Corp.,** Galveston, Tex. is planning quantity production of a new model "E" Navion. First deliveries are expected to be made within a year.

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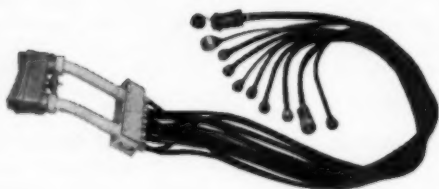
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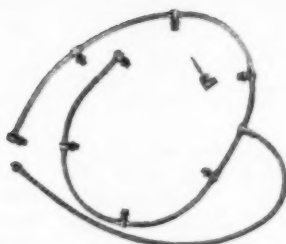
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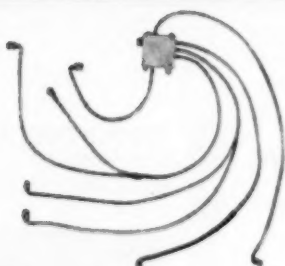
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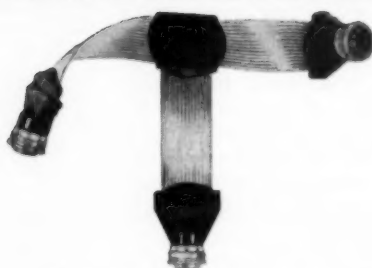
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SCINTILLA DIVISION
SIDNEY, NEW YORK



PEOPLE

... Manufacturing/Military

R. E. Hiner has been named assistant chief engineer-electronics by Convair Division of General Dynamics Corporation.

Roger Dion appointed assistant manager of purchasing for the AiResearch-Los Angeles Division of the Garrett Corporation.

Edward C. Kluender named manager of military systems engineering with General Electric Co.'s Communications Products Department.

John M. Pearce is manager of electronics requirements with The Martin Co., filling a new corporate position.



PEARCE



DE CASTRO

Mauricio DeCastro has been appointed sales manager for Latin America by Frederick B. Ayer & Associates, Inc.

C. Robert Gates was promoted to director of product planning for the Northrop Division of Northrop Corporation.

Charles K. Fennel has joined Texas Instruments, Inc. as manager of marketing techniques.

Sam D. Daniels, with Aircraft Industries Association for the past nine years, succeeds Ivar C. Peterson, who has resigned as director of technical service and leaves AIA March 1 after 13 years with the association.

Gerald E. Donovan, formerly vice president in charge of finance and administration for Moore-McCormack Lines, Inc., has joined Douglas Aircraft Co. as chief financial officer, succeeding **Frederick E. Hines**, who resigned several months ago.

Harvey Gaylord, president of Bell Helicopter Corp., was elected chairman of the Helicopter Council of Aircraft Industries Association for 1959, a position he previously held in 1952. **J. E. Leonard**, manager, military requirements for Cessna Aircraft Co., will serve as vice chairman and assume the chairmanship in 1960.

Henry S. Forrest promoted to vice president of Control Data Corporation.

Dr. Ronald Bell has joined Greer Hydraulics, Inc., in the capacity of senior research physicist.

E. O. Vetter has been elected assistant vice president of Texas Instruments, Inc. and **H. J. Wissemann** has been appointed general manager of the company's apparatus division.

George T. Mundorff, a former executive assistant to the vice president, has been appointed manager of business administration by Link Aviation Inc.

Jack M. Cherne, formerly with Aircraft Division, Hughes Aircraft, joins Vard, Inc. as director of engineering.

Charles J. Daniels, assistant chief engineer for All American Engineering Co., has been advanced to director of government projects.

James M. Stine, formerly manager of production control for Solar Aircraft Co., has been named assistant general manager for the Des Moines Division.

Morris W. Allen has been appointed technical assistant to the equipment sales manager and **Alex Dunn** supervisor of cost estimating by AC Spark Plug Division of General Motors.

Dr. Allen E. Puckett joins Hughes Aircraft as vice president and director of systems development laboratories. Other appointments include **Robert J. Shank** to vice president in charge of systems management and **Dr. Nathan I. Hall** as vice president and director of systems development laboratories, succeeding Shank.

G. A. Kiouss has been appointed manager of military equipment engineering for the General Electric Communications Products Department.

Edward W. Vernon has joined the engineering sales staff of the western region of U.S. Industries and **Joseph M. Till** has been named production control manager for company's Montebello plant.

Thomas Gaul has been named senior applications engineer at Epsco-West.

Col. James H. Rothrock, formerly vice commander of Wright Air Development Center, has been appointed manager of defense products for the West Coast electronics department of Radio Corporation of America.

Capt. Wendell W. Suydam (USN-ret.) named assistant purchasing manager for the Hamilton Standard Division of United Aircraft Corp.

Maj. Gen. Paul E. Ruestow will become commander of Middletown Air Materiel Area on Feb. 1, succeeding **Maj. Gen. George R. Acheson**, who retired Jan. 1. **Brig. Gen. Donald L. Hardy** will replace Gen. Ruestow as director of personnel and support at AMC Headquarters. **Brig. Gen. Charles E. Jung** will become commander of the Dayton Air Materiel Area succeeding **Col. A. A. Denton**, whose reassignment has not been announced. **Col. Adam K. Breckenridge** will succeed Gen. Jung as deputy commander of Oklahoma City Air Materiel Area.

Dr. Herbert F. York has been sworn in as first director of research and development under the new Defense Reorganization Act.

Vern Ammerman has been elevated by Pioneer Aluminum Co. to merchandising manager and **William F. Morrow** has been named general sales manager.

... Transport

O. Roland Frost, Jr. has been appointed director of properties for Braniff Airways and will head a newly formed properties department.

Louis Paul has been appointed first vice president of LAV-The Venezuelan Airline.



PAUL



FISHER

Richard E. Fisher was named project manager-jet planning for the Pacific-Alaska Division of Pan American World Airways.

Peter Murray takes over the position of West Coast regional sales manager for Irish Air Lines.

Kenneth G. Willis appointed manager of labor relations at American Airlines' Tulsa plant.

Ronald M. Macdonnell, deputy under secretary of the Canadian Department of External Affairs, elected secretary general of ICAO.

Joseph Crockett has resigned as manager of public relations for Fairchild Aircraft.



MACKLIN



WALKER

Robert Turner, vice president-traffic for the Air Transport Association, will also become executive secretary of the Air Traffic Conference, a post previously held by **Frank Macklin**. Macklin, assistant vice president-traffic, takes over as director of the tariff department. **J. B. "Judd" Walker** has just retired as director. **C. B. Newman**, assistant director of ATA's military bureau, will also serve as secretary of the industry committee on customer service procedures.



HOBBS



CHALFANT

G. Ward Hobbs has been named vice president-customer service and **Read Q. Chalfant** is named vice president-traffic and sales by Capital Airlines.

Ralston O. Hawkins, city attorney for Las Vegas, joins Bonanza Air Lines Feb. 1 as general counsel.

Lycoming

World's Leading Producer of Aircraft Engines

Lycoming—known throughout the world for fifty years for its quality engines—automotive, marine, industrial and aircraft. Now a prime producer of both reciprocating and gas turbine engines, Lycoming . . . entering its second half century . . . proudly powers more different types of aircraft than any other manufacturer.





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2. Beechcraft Travelair
3. Temco Riley Twin
4. Bee Aviation Queen Bee
5. Beechcraft Twin Bonanza
6. Trecker Royal Gull
7. McKinnon Super Goose
8. McKinnon Super Widgeon
9. Piper Apache
10. Eawdon T-1
11. P. eem SD-2 Drone
12. Champion DXer
13. Marrissey 2150
14. Piper TriPacer
15. Gummman AO-1 Mohawk
16. Colonial Skimmer
17. Piper Super Cub
18. Piper Comanche
19. Helio Courier
20. Aero Car Flying Auto
21. Mooney Mark 20
22. Cull Air A-4
23. Doyne 172A Conversion
24. Champion Sky-Trac
25. Davis DA-1

HELICOPTERS, VTOL/STOL

26. Ryan Vertiplane
27. Piasecki VZ-8
28. Brantly HO-3
29. Bell HU-1 Iroquois
30. Bell 47J Ranger
31. Chrysler Aerial Vehicle
32. Bell HTL-7
33. Bell 47G-2 Trooper
34. Hughes HO-2
35. Vertol 105
36. Umbaugh
37. Hiller 12E
38. Kaman HTK-1
39. Doak Model 16
40. Doman LZ-5
41. Aer Laudli L-55
42. Hiller H-23D Raven
43. Robertson VTOL
44. Kaman H-43B
45. Vertol 107
46. Vertol Tilt Wing

FOREIGN

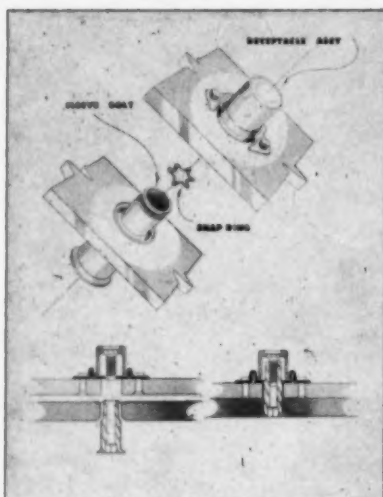
47. Piaggio P-166 (Italy)
48. Piaggio P-149 (Italy)
49. Miles HDM-106 (Gr. Britain)
50. Piaggio P-148 (Italy)
51. Bolkow-Klemm KL-107 (Germany)
52. Pilatus P-3 (Switz)
53. Kawasaki KAL-1 (Japan)
54. Saab 91 Safir (Sweden)
55. Partenavia P-57 (Italy)
56. Dornier DO-27 (Germany)
57. Blume BL-502 (Germany)
58. Aviamilano Nibbio (Italy)
59. Aeromere Falco (Italy)
60. Auster Workmaster (Gr. Britain)
61. Percival EP-9 (Gr. Britain)

For free reprints of this illustration, suitable for framing, write to: Public Relations Department, Lycoming Division, Avco Manufacturing Corporation, Stratford, Conn.



Lycoming

A Division of **Avco** Manufacturing Corporation | Stratford, Conn., Williamsport, Pa.
Circle No. 12 on Reader Service Card.



Panel Fastener

Nutt-Shel Co. has made available a structural panel fastener in standard and self-sealing types. It comes in two lug and corner mounting styles. Sleeve bolt has self-jacking action to eliminate binding problems in panel removal. Fastener permits panel misalignment up to 0.040 in. per hole and closes gaps up to $\frac{1}{8}$ in. Sleeve bolt can be easily removed, and receptacle can be replaced without drilling out attaching rivets. Receptacle is self-draining to prevent moisture accumulation.

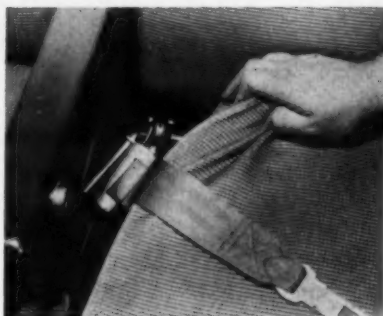
Circle No. 107 on Reader Service Card.



Oxygen Masks

Aro Equipment Corp., California, is supplying the oxygen masks for the Boeing 707 series. If cabin pressure falls below a certain level, the masks pop-out. The mask is made of plastic which molds itself to any facial configuration. Pressure regulation is uniform, so that each user gets the same amount of oxygen regardless of his position in the airplane. A built-in check valve is incorporated in the liter reservoir bag. Another valve prevents inhalation of carbon dioxide.

Circle No. 108 on Reader Service Card.



Safety Belt

Aerotherm Corp., with the help of Cornell University's Department of Aviation Crash Injury Research, has developed an inertia-locking safety belt for airline use. Called the Aerobelt, it uses a small reel attached to the seat. Under normal conditions, the passenger has considerable freedom as the belt retracts and unwinds in response to his movements. However, an acceleration of approximately 0.8G causes the reel to lock.

Circle No. 109 on Reader Service Card.



ADF Antenna

Bendix Radio Division, Baltimore, Md., has developed a new fixed loop ADF antenna said to improve performance of all ARINC-approved ADF systems. Less than 1-in. thick, it can be attached to the outside skin of the airplane—either top or bottom—without fairings. An adaptor permits flush mounting the antenna in any existing ARINC-type flush-loop cavity.

Circle No. 110 on Reader Service Card.

Product Briefs

Tape tool—Labelon Tape Co., Inc. has a new charting tool for use with the company's narrow tapes. The applicator handles tape in 14 solid colors and 10 patterns. Widths from $\frac{1}{8}$ to $\frac{1}{64}$ in. are available. Price, with roll of tape, is \$1.00.

Circle No. 111 on Reader Service Card.

Ground support—Latest multipurpose ground support unit is offered by Atlas Copco, New York. Called the "Air Partner," it uses a rotary screw-type compressor to deliver driving air to its small, high speed turbines for

aircraft engine starting. Ground deicing can be accomplished with a special nozzle.

Circle No. 112 on Reader Service Card.

Miniature switches—Inerta Switch, Division of Safe Lighting, Inc., N.Y. has available single-pole, double-throw, or single-pole, triple-throw miniature inertia switches actuated by acceleration, impact and/or shock. Acceleration sensitivity can be adjusted from less than 1G to over 100G's with 1% accuracy. It weighs 1.75 oz.

Circle No. 113 on Reader Service Card.

Technical Literature

Jet silencers—15-page color brochure describes fixed, portable, and semi-portable silencers for all types of jet aircraft. Details on ducting of air, methods of suppression and amount of sound reduction possible are included. Koppers Co., Inc.

Circle No. 114 on Reader Service Card.

Hangar planning kit—Complete specifications for construction of airplane hangars. Has detailed dimensions of all types of aircraft from Aeronca Champ to latest jet transports with template sheets and grid paper to determine your requirements. Included is a sheet with answers to common questions regarding dimensions, function, clearances and costs. Dresser-Ideco Co.

Circle No. 115 on Reader Service Card.

Ideas wanted—List of 82 new technical problems the Air Force would like solved by civilian inventors. Includes all phases of aircraft industry from equipment to instrumentation. Tells how to submit solutions for consideration. By National Inventors Council, U.S. Dept. of Commerce.

Circle No. 116 on Reader Service Card.

Fire extinguishment—Four-page brochure gives the fundamentals of fire extinguishment with description of the three classes of fires. Gives characteristics of flammable liquids and definitions of terms used in discussions of ignition and fire. Ansul Chemical Co.

Circle No. 117 on Reader Service Card.

Jet takeoffs—Eight-page booklet on a new takeoff monitoring system for jet takeoff performance. System uses measurement of acceleration to give

Engine overhaul—Contains "how to" photographs and cost figures of major overhaul steps. 25 cents, from Flight Safety Foundation, 468 Fourth Ave., N.Y. 16, N.Y.

INTERNATIONAL REPORT

By Anthony Vandyk

pilot an "abort" signal. The booklet outlines the job of a takeoff monitor, the functions and features of Honeywell system, as well as component description and system operation details. Aero Div. of Minneapolis-Honeywell Regulator Co.

Circle No. 119 on Reader Service Card.

• **Preamplifiers**—Four-page brochure gives detailed electrical and mechanical data on complete line of low-noise, high-frequency preamplifiers. A.R.&T. Electronics, Inc., Subsidiary of Baldwin Piano Co.

Circle No. 120 on Reader Service Card.

• **Stainless steels**—Fact sheet about Allegheny Stainless AM350 and AM355, both new alloys. Includes curves of strength properties and description of all physical properties. Allegheny Ludlum.

Circle No. 121 on Reader Service Card.

• **Instrument cases**—20-page design manual on standard and special instrument cases is directed at the design engineer. Each size is illustrated with fully detailed prints. Instrument Case Div. of TA Mfg. Corp.

Circle No. 122 on Reader Service Card.

• **Digital recording system**—Four-page brochure gives specifications recorders and printers. Illustrates an installed system with the parameters to be recorded. Prices included. Datex Corp.

Circle No. 123 on Reader Service Card.

• **Aerial applicators**—Several revised brochures describe complete line of dust and liquid spray aerial applying equipment. A new price list is included. Transland Aircraft.

Circle No. 124 on Reader Service Card.

• **Retaining rings**—24-page catalog containing descriptions and illustrations of currently available retaining rings, pliers, and accessory tools. Includes descriptions of use of each ring type, and size ranges of standard rings. Tells of 72 applications aimed at lower unit costs. Published by Walde Kohinoor, Inc.

Circle No. 125 on Reader Service Card.

• **Filters**—Two-page engineering data sheet describing a line of 40-micron breather filters for free flow of clean air into hydraulic fluid, and fuel and oil reservoirs. Includes photographs of filters, as well as air-flow pressure drop curves, cross-section drawings and specification tables. Bendix Filter Division.

Circle No. 126 on Reader Service Card.

Since it is considered normal for a new aircraft to be faster than the one it replaces some eyebrows were raised when Aer Lingus introduced the Fokker F-27 into Dublin-Paris service last month. This route was formerly operated with Viscounts, and the change of equipment resulted in a 15-minute increase in flying time.

Incidentally, before Aer Lingus' first F-27s complete 5,000 flying hours, they will have to go back to Fokker to be fitted with a heavier gauge lower skin in the wing root area. The need for this minor modification was shown during the manufacturer's fatigue test program—one of the most extensive ever undertaken. All but the first nine will have the thicker skin incorporated before delivery.

• **From the men on the spot**—U.S. Air Attaches from most countries in Western Europe and the Middle East have been invited to a meeting in Geneva at the end of February. European representatives of U.S. aircraft and engine manufacturers have organized the conference, and their primary purpose is to brief the attaches on their products and to learn from these men on the spot the requirements and problems of the various Western European and Middle East nations. Although the Geneva meeting will be on a much smaller scale than the Latin American export conference sponsored by AIA in Miami Beach a couple of years ago, indications are that it will be equally successful in providing a forum for exchanges of view between individuals who have much in common but who rarely have an opportunity to get together.

• **Aircraft make good exports**—Britain exports modern aircraft at a price averaging \$45 per pound while British automobiles are exported at about \$1 per pound, according to Edward Bowyer, Director of the Society of British Aircraft Constructors. Bowyer also notes that aircraft exports are particularly beneficial to the British economy because "they employ very little raw material . . . but engage the services of a great deal of brain power and labour." In 1958 aircraft

exports were worth some \$450 million, 11% of Britain's total engineering exports.

• **About time**—Congratulations to British European Airways for introducing pressurized equipment on its routes between Berlin and West Germany. For many years the three carriers linking Berlin with West Germany—Air France, BEA and PAA—seemed to have a gentlemen's agreement to keep modern aircraft off their routes. But now BEA has broken the tradition by putting Viscounts on its German internal services, and Air France and PAA probably will have to follow suit.

Modern aircraft have been rare in East Berlin also. Until last year airlines of the Communist bloc nations (including the East German Lufthansa) operated exclusively IL-12s and IL-14s there. But in 1958, Poland's LOT brought in the Convair 240. With a little bit of luck, Berliners in 1959 may see such "modern" aircraft as the DC-6B, Constellation and Convair 340!

• **Another French bilateral**—Cooperation between a U.S. company and a French manufacturer is saving money for American taxpayers and providing work for the French aircraft industry. Under an agreement with Aircraft Engineering & Maintenance Company, part of the Babb-Transocean empire, France's Brequet company is now responsible for the repair and overhaul of USAF F-100s based in Europe. This work, previously performed by USAF personnel, is carried out at the USAF's huge Chateauroux base in Central France.

• **Plug for competition**—When one airline takes an advertisement to publicize the services of two others, this is news. Swissair recently did this to "salute PAA and BOAC on the inauguration of their regular jet service." The Swiss airline expressed its "admiration and best wishes" to its two competitors "as pioneers of a new era in air transportation" and finally got around to giving itself a modest plug, pointing out that it has "assured its place in this age of jet air travel" with its program to operate DC-8s, Convair 880s and Caravelles (A/A, Dec. 15, p. 28).

There are more and louder demands now for changes in the **Railway labor act**. Sen. George Smathers (D.-Fla.) thinks the Act is "archaic." He will ask for a Congressional investigation, says he favors requiring airlines to keep operating while labor negotiations are in progress, with settlements made retroactive. Aviation subcommittee chairman A. S. Mike Monroney (D.-Okla.) states that he would agree to an investigation, providing there were no strikebreaking implications. Ranking Minority member Andrew F. Schoepfel (R.-Kan.) endorses Smathers' views.

CAB has decided it can retain control over intrastate airline operations in Alaska until the Alaskan legislature sets up its own regulatory system. Justice Department agrees. This allays fears of some airline officials in the 49th state that new operators might flock in and start paralleling them on main routes, free of any CAB control.

Increase of about 7% in world air traffic is predicted for 1959. Last year's passenger total is estimated at 89 million; International Air Transport Association expects 1959 to produce 95 million. If estimate holds, the 100 million mark should be topped in 1960. Traffic growth last year was not nearly as great as in previous years. Passenger-miles were up 5%, passengers 4%. For the past 10 years, passenger-miles have gained by 13% or more each year, while passengers have jumped by at least 12%.

Look for Pan American to order a Convair Jet, either the 880 or newer 600, for its operations in the Caribbean, and Central and South America. PAA favors Convair's offering, considers it the only suitable model for its intermediate network.

A big year on the Atlantic is expected by Pan American World Airways. Company already has the jump on competitors with its Boeing 707s. By the peak summer season it will be operating 75% of its total transatlantic capacity with jets. Incidentally, in first six weeks of operation, PAA jets hauled 12,168 passengers, an average of 101 per flight, and load factor of 94.2%.

Cargo officials look for a 10.5% increase in airfreight ton-miles flown this year by domestic trunks and all-cargo lines. But at least two transcontinental operators didn't forecast any appreciable gain, believing that American Airlines, first in the field with jet, will corner most of the business. On another front, airlines are watching closely Railway Express Agency developments. New York Central, one of the biggest REA stockholders, says it will pull out of the rail-owned organization at the end of this year. If other roads follow, REA may undergo a change of ownership, but it won't go out of existence. Airlines start negotiating a new air express contract with REA this month.

Added responsibilities have been assumed by Northeast Airlines President J. W. Austin, who now has complete charge of all operations and sales activities. Formerly he dealt primarily with sales matters. George Gardner is board chairman. NEA has sold one Convair (to VARIG of Brazil), is disposing of remaining four. Fleet will then include 10 Viscounts, 10 DC-6Bs, 11 DC-3s. Austin is pleased with progress in tapping so-called "business markets"—Boston-Washington, New York-Washington—believes NEA can commit itself for competitive equipment for Florida route before too long.

Industry reaction (and possibly some from Capitol Hill) can be expected over the bottom-rung assignment of airports under the Bureau of Facilities in Federal Aviation Agency. But the concern stems not so much from the psychological effects of being listed low on the FAA totem pole as from apprehensions over FAA chief Quesada's ability to land a single director of the Bureau of Facilities capable of doing justice both to the mammoth airways modernization program and to airport needs.

Strikes hit hard at airport revenues, in some instances cutting receipts by as much as 50%. Situation at some airports borders on the critical, with airport management hard pressed to meet interest payments. Most affected are those served by either Eastern or American that do not have other airlines available to take up the slack caused by their shutdown.

Look for a major step by FAA to modernize the nation's air weather service. It will be a joint USAF-Weather Bureau-FAA program based on a semi-automatic system (433L) proposed by Air Force's Combridge (Mass.) Research Center. FAA contract of \$97,905 to Technical Operations, Inc., Burlington, Mass., to study "aging" of air weather information is but a small step compared to the far-reaching automation embodied in the 433L system.

Next airport aid bill will be S.1 if plans of Senate proponents to give the bill this prestige spot are carried out.

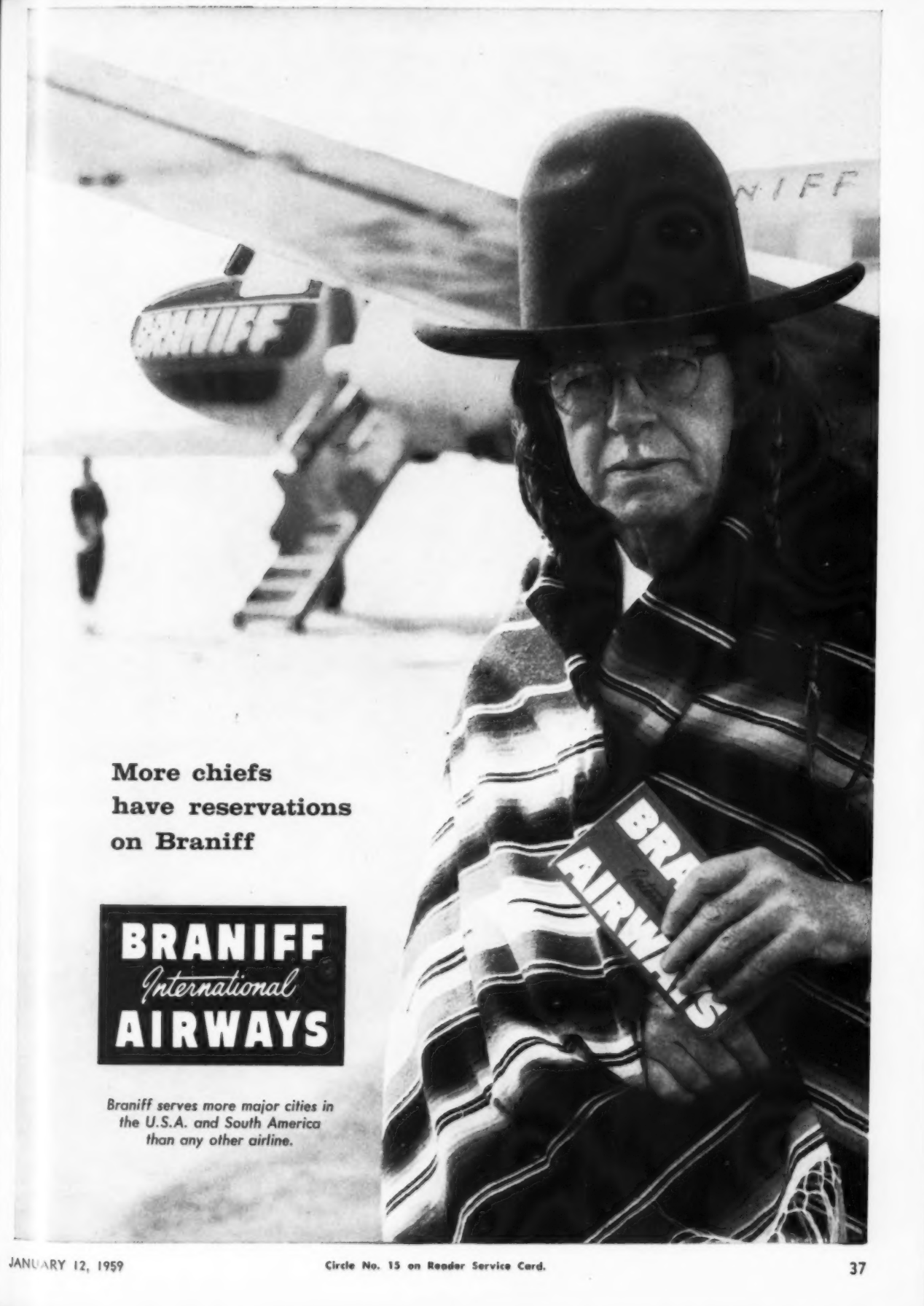
Newest entry with bid to solve jet parking problem is Space Corp., Dallas, builder of support systems for Atlas, Titan and Bomarc missiles. Company has proposed the Bolton Aircraft Positioning and Locating System, a combination turntable and mechanical towing rig it

claims will cut ramp area required for aircraft positioning by 25% to 40%. Company's address is P.O. Box 5175, Dallas 22.

Shortage of air traffic controllers may be on the wane. Some 400 top applicants on the federal service entrance exam register will be put through ATC training as an experiment to determine if actual aviation experience now required is really a necessity in shaping future controllers. Success of this trial would mean a valuable new source of candidates for ATC duty.

Number of CAA regions may be expanded. Candidate for a split is Region 2 at Ft. Worth which now extends all the way to Florida. If effected, headquarters probably would be reinstated at Atlanta, Ga., where they were located several years back when CAA slashed its regions from nine to six as part of an economy wave.

Simpler, safer traffic control is being shaped for Europe. The six "common market" countries are now negotiating a joint reorganization of their civil air navigation facilities under a single authority for which the name Eurocontrol has been suggested. One working group has completed the articles of association, two others are studying the financial and technical aspects of the plan. The results of the studies are due early this month for final consideration January 27 by the heads of civil aviation administration. Ministers of Transport may meet in late February to prepare for ratification a treaty creating the joint air navigation authority. Idea for the authority stems from the inadequacy of the present system of dividing European air traffic control according to political borders. Broader regional control zones (probably two) will be created on a supranational basis with headquarters possibly in Luxembourg and Rome.



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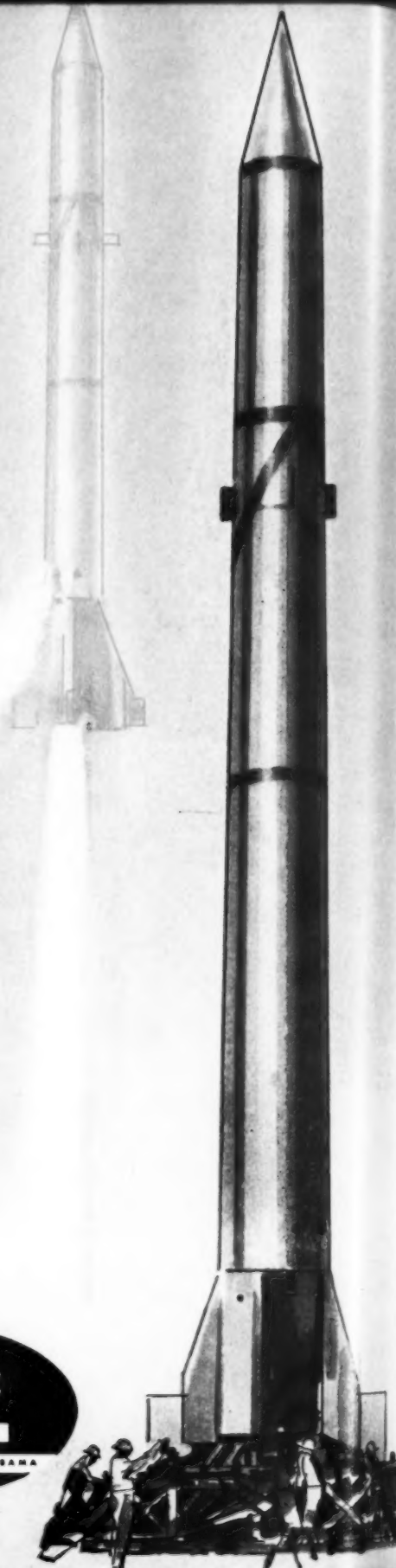
The ARMY BALLISTIC MISSILE AGENCY, (best known by its initials: "ABMA"), is a primary element of the Army Ordnance Missile Command. In conducting research, development, fabrication and testing of missile systems and components, ABMA calls upon the full technical and manufacturing capabilities of American industry. Through its successful development of space vehicles and missiles, ABMA has focused the eyes of the world upon Alabama and has brought credit to the industrially expanding South.

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STATISTICS

Summary of U.S. Airline Revenues and Expenses For Third Quarter 1958 vs. Third Quarter 1957

Compiled by American Aviation Publications from Official CAB Data

Airlines	Total Operating Revenues			Passenger Revenues			Total Operating Expenses			Net Operating Income		
	1958 (In Dollars)	1957	% Change	1958 (In Dollars)	1957	% Change	1958 (In Dollars)	1957	% Change	1958 (In Dollars)	1957	% Change
DOMESTIC												
American	83,121,389	78,224,796	6.3	73,281,983	70,022,262	4.7	72,917,506	72,161,992	1.0	10,203,883	6,062,804	68.3
Brantiff	15,058,490	14,074,952	7.0	13,674,979	12,900,166	6.0	13,670,773	12,941,447	5.6	1,387,717	1,133,505	22.4
Capital	26,500,447	25,488,494	4.0	24,782,430	23,911,379	3.6	25,032,930	25,094,072	-0.2	1,467,517	394,422	272.1
Continental	8,003,574	6,636,028	20.6	7,332,416	6,154,491	19.1	7,888,419	6,303,304	25.1	115,155	332,724	-65.4
Delta	20,452,114	18,794,871	8.8	18,238,814	17,079,305	6.8	19,600,679	18,215,527	7.1	851,435	579,344	47.0
Eastern	58,009,483	55,982,545	5.0	54,956,313	52,622,831	4.4	56,785,514	55,621,183	2.1	2,023,969	361,362	460.1
National	11,378,485	10,384,173	9.6	10,063,721	9,334,041	7.8	12,367,303	10,623,800	16.4	-988,818	-239,627	.....
Northeast	5,831,644	4,885,397	19.4	5,500,110	4,613,650	19.2	7,350,891	5,764,947	27.5	-1,519,227	-879,550	.....
Northwest	19,493,741	15,990,363	21.9	17,597,633	14,434,255	21.9	16,690,693	14,275,059	16.9	2,803,048	1,715,304	63.4
Trans World	59,647,861	56,563,486	5.5	55,302,055	52,595,254	5.1	52,072,474	53,694,994	-3.0	7,575,387	2,868,492	164.1
United	83,653,579	76,880,535	8.8	73,891,295	68,401,015	8.0	71,037,523	67,279,653	5.6	12,616,056	9,600,882	31.4
Western	11,964,292	11,595,244	3.2	11,173,824	10,854,120	2.9	10,346,245	9,336,667	10.8	1,618,047	2,258,577	-28.4
TOTALS	403,915,119	375,500,884	7.6	345,795,573	342,922,769	6.7	365,760,950	351,312,645	4.1	38,154,169	24,188,239	57.7
TERRITORIAL												
Caribair	547,951	491,383	15.6	517,841	446,250	16.0	500,785	432,870	15.7	67,164	58,513	14.8
Hawaiian	2,666,289	1,816,294	47.9	1,409,271	1,557,248	-3.3	2,182,334	1,580,948	38.0	503,955	235,346	114.1
Trans Pacific	773,334	824,948	-6.3	701,519	756,621	-7.3	690,354	728,521	-5.2	82,980	96,427	-13.9
TOTALS	4,027,574	3,132,625	28.6	2,828,631	2,760,139	2.5	3,373,473	2,742,339	23.0	654,101	390,286	67.6
INTERNATIONAL												
American	1,910,528	1,643,285	16.3	1,643,318	1,352,223	21.5	1,717,397	1,421,890	20.8	193,131	221,395	-12.8
Brantiff	1,992,763	2,353,414	-15.3	1,721,154	2,052,842	-16.2	2,010,168	2,165,592	-7.2	-17,405	187,822	.....
Delta	1,455,871	1,746,549	-16.6	1,340,574	1,618,085	-17.2	1,392,561	1,428,083	-2.5	63,310	318,466	-80.1
Eastern Overseas	6,880,845	5,605,067	22.8	6,410,277	5,219,481	22.8	6,104,610	4,779,986	27.7	776,235	825,081	-5.9
San Juan	4,707,019	4,427,572	6.3	4,332,248	4,093,207	5.8	4,314,658	3,811,613	13.2	392,361	615,959	-36.3
Bermuda	948,323	755,189	25.6	904,661	716,011	26.3	799,640	452,970	50.0	268,683	302,219	-11.1
Mexico	1,225,503	422,306	190.2	1,173,368	410,463	185.9	1,110,312	515,403	115.4	115,191	93,977	.....
National	1,246,848	772,866	61.3	1,138,357	706,011	61.2	972,651	771,467	26.1	274,197	1,399	.....
Northwest	9,931,204	8,171,136	21.5	6,581,253	5,635,220	16.8	7,067,549	6,347,472	11.3	2,863,655	1,823,664	57.0
Panagra	4,509,477	5,229,004	-13.8	3,210,156	3,804,849	-15.6	4,692,446	4,900,393	-4.2	-182,969	328,611	.....
Pan American System	91,680,133	90,954,505	0.8	73,321,261	73,341,937	-1.6	81,353,350	78,647,814	3.4	10,326,783	12,306,691	-16.1
Latin American	22,910,582	25,819,187	-11.3	17,550,490	19,767,831	-11.2	23,742,373	24,644,137	-3.7	-831,791	1,175,050	.....
Atlantic	46,564,701	41,232,632	12.9	39,046,457	35,274,113	10.7	39,087,867	32,816,484	18.8	7,561,834	8,415,948	-10.1
Pacific	21,027,445	22,119,872	-4.9	14,581,676	16,821,048	-13.3	17,330,763	19,073,391	-9.1	3,706,682	3,046,481	21.7
Alaska	1,167,405	1,782,814	-34.5	953,631	1,478,945	-35.5	1,277,347	2,113,602	-39.6	-109,942	-330,788	.....
Trans Caribbean	NR	NR	.....	NR	NR	.....	NR	NR	.....	NR	NR	.....
Trans World	26,705,457	23,277,591	14.7	21,728,992	19,853,188	9.4	23,397,299	19,209,787	21.8	3,308,158	4,067,804	-18.7
United	4,752,355	4,695,401	1.2	4,472,162	4,470,426	0.04	3,521,179	3,370,068	4.5	1,231,176	1,325,333	-7.1
Western	373,790	290,639	28.6	354,858	285,716	24.2	461,082	425,400	6.0	77,292	-134,761	.....
TOTALS	151,439,271	144,739,457	4.6	120,733,362	118,340,178	2.0	132,680,292	123,467,952	7.5	18,758,979	21,271,505	-11.8
NR—No Report.												
LOCAL SERVICE												
Allegheny	3,079,230	2,197,039	40.2	1,678,796	1,567,534	7.1	2,423,282	2,244,265	8.0	655,948	47,226	.....
Bonanza	1,107,519	982,048	24.2	647,003	507,009	27.6	1,166,973	947,084	23.2	59,454	55,036	.....
Central	NR	1,048,914	.....	NR	408,411	.....	NR	1,147,973	.....	NR	99,059	.....
Frontier	1,812,927	1,683,106	7.7	947,576	988,840	-4.2	1,885,647	1,586,551	18.8	72,720	94,555	.....
Lake Central	995,970	925,801	7.6	503,530	433,212	16.2	951,681	907,416	4.9	44,289	18,385	.....
Mohawk	2,418,331	2,431,435	5.4	1,628,398	1,453,701	12.0	2,272,517	2,185,170	4.0	145,814	246,265	-40.8
North Central	4,086,978	2,858,333	43.0	2,473,020	2,227,858	11.0	3,415,645	2,935,422	16.4	671,333	77,089	.....
Omaha	2,104,951	1,960,146	7.4	1,312,451	1,174,367	11.8	2,029,620	1,970,186	3.0	75,331	10,040	.....
Pacific	1,798,774	1,821,428	-1.2	1,198,427	1,080,868	10.9	1,856,286	1,470,723	26.2	57,512	350,705	.....
Piedmont	2,399,139	2,246,146	6.8	1,614,460	1,483,900	8.8	2,245,144	2,085,810	7.6	153,995	160,336	-4.0
Southern	1,554,459	1,147,518	35.5	671,137	592,406	13.3	1,236,430	1,153,564	7.2	318,029	6,046	.....
Trans-Texas	1,782,055	1,738,147	2.5	922,238	875,557	5.3	1,697,854	1,644,470	3.2	84,201	93,677	-10.1
West Coast	1,256,965	1,142,010	10.1	779,969	709,179	10.0	1,279,242	1,120,489	14.1	22,777	21,321	.....
TOTALS	24,397,298	22,092,071	15.9	4,377,005	13,502,842	9.8	22,440,321	21,399,323	10.9	1,936,977	692,748	.....
HELICOPTER SERVICE												
Chicago	533,777	351,878	51.7	194,312	98,180	97.9	498,184	415,362	19.9	35,593	63,484	.....
Los Angeles	348,868	342,987	1.7	53,226	52,751	0.9	292,509	298,783	-2.1	54,359	44,204	27.5
New York	803,904	760,605	5.7	185,574	160,931	15.3	732,298	655,540	11.7	71,606	105,045	-31.8
TOTALS	1,686,549	1,455,470	15.9	433,112	311,862	38.9	1,522,991	1,369,705	11.2	163,558	85,745	90.7
ALASKAN												
Alaska	1,779,302	1,416,840	25.6	699,555	495,351	41.2	1,708,911	1,505,033	13.5	70,391	88,193	.....
Alaska Coastal	492,283	462,005	6.6	286,654	252,628	13.5	403,981	378,575	6.7	88,302	83,430	5.8
Cordova	248,924	467,455	-46.7	40,818	43,460	-6.1	248,193	427,540	-37.3	19,269	39,915	-51.7
Ellis	326,896	339,926	-3.8	195,309	203,166	-3.9	274,371	294,431	-3.5	52,525	55,495	5.4
Nor. Consolidated	790,763	641,440	23.4	285,322	269,937	5.7	646,209	614,756	5.1	144,554	26,684	441.7
Pacific Northern	3,352,064	2,944,253	12.3	2,396,163	2,219,444	8.0	2,688,371	2,585,840	4.0	643,693	380,413	69.2
Revere	NR	517,660	.....	NR	340,511	.....	NR	383,842	.....	NR	133,818	.....
Wien	1,363,981	1,282,508	6.3	406,646	386,925	5.1	1,320,293	1,100,523	10.9	43,680	91,985	-52.5
TOTALS	8,334,213	8,094,087	10.0	4,310,467	4,211,422	11.4	7,310,329	7,370,540	4.6	1,023,884	723,547	173.6

JANUARY 12, 1959

Circle No. 16 on Reader Service Card.

EXCLUSIVE

The Ins and Outs of Soviet Transport

By Wayne Parrish

Here are some sidelights of my 19-day trip to the Soviet Union in October:

• **Visiting Aeroflot**—The big Russian airline has unpretentious headquarters in a rather narrow seven or eight-story building in the center of Moscow, about a quarter-mile from Red Square. Inside the main door is a tiny lobby, a single elevator, a stairway which is barred and a uniformed armed guard. Nobody goes up in the elevator without getting clearance by telephone to the guard. Obviously only the top Aeroflot personnel are in this building.

On my visit, the guard had been alerted that I was coming. I was put in the self-operated elevator and sent to the seventh floor, where I was met by Victor Novash, one of the English-speaking officials of the foreign department. We went at once across the reception area to a kind of board or meeting room with a long table surrounded by about a dozen chairs. The furnishings were plain and there was virtually no decoration of any kind. It was here that I had my 45-minute discussion with three Aeroflot officials, me on one side of the long table and the three Russians facing me on the other side.

• **The Contact**—It isn't the easiest thing in the world to meet with Russian officials of any kind, unless they have



Photos by Wayne W. Parrish

IL-18 AT MOSCOW. This aircraft is due to go into service early this year.

invited you over in the first place. In my case Aeroflot had been informed of my coming but the one man I was most anxious to meet was on vacation. It is customary when you arrive in Moscow to inform Intourist, the agency handling all foreigners, of your special requests and desires. On my first day I told my Intourist interpreter that I wanted to pay a call on Aeroflot.

Next morning she told me that it would be best if I contacted Aeroflot direct since I was known to the airline. This was fine with me, but how was I to do it in a country where the language is so difficult and there isn't even a telephone directory? So I did what I have done in many parts of the world—I turned to Scandinavian Airlines System. SAS had its office in my hotel, the National. The efficient Russian girl who acts as secretary and office manager, and who speaks excellent English, was most obliging. She

did the telephoning to Aeroflot, set up the appointment and actually took me in a cab to the Aeroflot building to make sure I got there. SAS has helped me out many times many places.

Yes, there are taxis in Moscow, a lot of them. But try and give directions without knowledge of Russian. If you use them, you have to have somebody write out the destination to show the driver.

• **Passenger Handling**—If you are an international traveler, you have little to worry about. Your baggage is rarely inspected and Intourist takes charge of getting it into your limousine or onto the departing airplane. You don't tip the porters and in fact you rarely see them. But domestic travel is something else again. The check-in for a 70-passenger flight is as hectic as getting onto a New York subway in rush hour. In the U.S., air passengers line up at a



MAIN ENTRANCE to Vnukova Airport, Moscow. Less than 100 flights per day depart from here.



VNUKOVA TERMINAL from field. TU-104s, foreground, are poor excuse for a modern transport, but many are flying.

counter; in Russia it's a free-for-all to see who can push up to the counter first. Women weigh and handle the bags, pass on the weight to a functionary at a desk who determines if there is any excess to pay—and there often is because domestic baggage allowances are low. Without an Intourist interpreter to lead the way, the foreigner would be quite lost in the mad shuffle.

• **Terminals**—With the sharp increases in Soviet air traffic, all terminals are becoming inadequate. They were poorly designed to start with. In every terminal there are people sleeping overnight waiting for plane departures. Every terminal has a restaurant, open all hours. Intourist has an office and usually a lounge of some sort for international travelers and VIPs. In most terminals there are rooms available and in some instances there is a so-called hotel nearby the terminal, as very often plane-loads of passengers must be accommodated when flights are canceled en route. All terminals are dreary and drab by western standards.

• **Moscow Surprise?**—Aeroflot officials would only confirm that a new airport was being built at Moscow, but rumors are that the USSR is building what it hopes will be the "biggest and best and most lavish" airport in the world, to be opened with elaborate surprise sometime in the next few years. In the West no such big project could possibly happen in secret, but Westerners are restricted to traveling within 25 miles of Moscow and the new airport is rumored to be as much as 50 miles out, to be connected with Moscow by helicopter service. If the rumor is true, then watch for a huge terminal of marble, escalators and fancy lighting. The present airport, Vnukovo, 18 miles southwest of Moscow, is inadequate and no plans seem to be in the making for improving it. So Westerners believe the rumors of a huge new project are probably true. Opening date: Unknown. Probable location: North, northeast or east of Moscow.

• **Food Service**—You are likely to get a better meal on a TU-104A than at a hotel or restaurant in Russia. Aeroflot is making a real effort. Three stewardesses (not uniformed) serve hot meals on the jets and as a rule they are quite good, Russian style. One meal I had consisted of cold chicken, toughest on record, but twice I had steaks which were quite tasty and good. Even fresh bananas were served on the westbound

flight out of Siberia, having been flown out there especially for Aeroflot food service. Bananas are quite a delicacy in Russia. Bread and rolls on Aeroflot are better than you get on the ground.

• **The Gloomy TU-104A**—This first Russian jet is a poor airplane in more ways than one. It is sluggish on take-off, has poor landing and braking characteristics, and its pressurizing system is definitely inferior. To the passenger it has a gloomy appearance inside. Lights are very dim, insufficient for reading, until after the plane is in the air. The galley is poor and messy. Carpeting on the floor bunches up. The seats are not holding up very well and are too low for comfort for long flights. Toilet facilities are adequate but not attractive, and you are likely to find there is no water available for washing. The TU-104A is a poor excuse as a modern transport, but the fact is that there are lots of them flying, every seat filled, and they do fly at high speed and high altitude.

• **Airports**—There is probably not a major airport in the Soviet Union that hasn't construction in progress. Aprons are being enlarged, runways extended and new ones built (concrete being used), and other work being done. All

airport work is under direct control of Aeroflot. It is a major effort.

• **Weather**—The biggest handicap to expansion of Aeroflot is the inability of Aeroflot to fly in bad weather and land in low ceiling conditions. The airline is being super-cautious about weather. At Moscow when every Aeroflot plane is grounded by low ceiling, Western planes arrive and depart normally. A lot of pilot training and better airway aid facilities will be needed before Aeroflot matches the West in all-weather flying. As for Russian passengers, they don't seem to mind waiting. They've queued up all their lives for the basic necessities of life and delays of a day or two in flying don't seem to bother them.

This is the third of a series of articles by the editor and publisher of AMERICAN AVIATION following a 30,000-mile air trip which featured 19 days in the U.S.S.R., Poland, Afghanistan, India, Nepal and Turkey. In addition to this series, The Associated Press carried for national distribution a two-part series on civil aviation in Russia under Mr. Parrish's byline.

Allegheny Is Commuter Route

• **In September, 1946**, 17,300 local passengers flew between the old Detroit City Airport and Cleveland Hopkins Municipal Airport.

• **One year later**, after the airlines had moved farther out of Detroit to Willow Run Airport, this traffic nose-dived to 7,000.

• **Ten years later**, Willow Run-Cleveland Hopkins local business was still 6,000 short of the September, 1946 level.

• **Now**, however, Allegheny Airlines believes that its recent switch from Willow Run to the new and closer-in Detroit Metropolitan Airport gives it a chance to move in and develop local traffic between these two major industrial cities which have a unique transportation situation: They're 90 air miles apart, but surface distance is 170 miles around the lower part of Lake Erie.

Allegheny's proposal: A no-reservations, low-fare, high-frequency commuter-type operation which it is convinced will zoom business way above the 17,300 total of September, 1946.



Allegheny President Les Barnes

"... We think it will pay off."

In fact, Allegheny maintains that other airlines on the route would retain their 1957 level of traffic—10,600 passengers in September, the survey

By Fred S. Hunter

Break-even load factor on Western Air Lines was brought down to 46.4% in October—lowest in the company's history. The reasons: Mainly the CAB passenger fare increase but also, in part, the successes of management. WAL is a well run airline.

The low break-even point reminds us of the late Joseph F. Ringland, the Minneapolis banker, who was a WAL director. At each board meeting Ringland would propose passage of a resolution that "Kelly get the load factor up." Kelly, of course, is Arthur F. Kelly, WAL's personable vice president of sales and a man who was born to count load factors instead of sheep on sleepless nights.

Neither Kelly nor WAL nor any other airline will have it so good on a break-even point in 1959. Before the fare increase, WAL's was around 52%. If it isn't already back up there, it soon will be. The increased costs of labor in 1959 will be about 6% and this will just about eat up the added return from the fare increase. A 14% increase in teletype costs became effective on December 2 and will add substantially to the cost of doing business.

• **More high costs**—The Douglas Aircraft Co. recently upped the price of spare parts—first general increase since 1952, incidentally—and this will add about 4% more to the parts bill for WAL's DC-6Bs in 1959. President T. C. Drinkwater noted at the recent stockholder meeting that another place where WAL faces increased costs is in charges by airports; these are going up everywhere. There is one note of cheer, however. It looks as though fuel costs might remain the same. There are still crude petroleum surpluses and aviation fuel prices are tied in.

• **Big airlift**—The Douglas C-133's feat of airlifting the heaviest load in the history of aviation by carrying 117,900 lbs. of cargo to 10,000 ft. in a flight at MATS base at Dover, Del., was deserving of more public recognition than it got. The big turboprop flew a payload exceeding its own empty weight by more than

1,000 lbs. The fuel aboard added another 42,500 lbs. No one intends to convey the impression C-133s are going to airlift overloads as a regular thing, but the flight was an impressive demonstration of the plane's capacity, and it is too bad the publicity stage at the time was occupied by events of a more spectacular nature, such as the first *Thor* shot at Vandenberg and the orbiting of the *Atlas*. The Douglas boys dreamed up the idea of loading the airplane with potatoes to dramatize the flight for the public. In one airplane load, enough food to feed all of West Berlin. But, alas, potatoes change weight, and rules of the Federation Aeronautique Internationale, to make the flight an official record-breaker, require the weight to remain constant. So instead of potatoes for headlines, the C-133 carried cartons of engine oil for the record book.

• **Baby jet**—The Air Force and North American Aviation have held preliminary discussions with the CAA on type certification procedures covering the twinjet T-39 Sabreliner, although start of actual CAA flight-testing is still a year away. NAA will not use the prototype, currently flying with 50-hour engines, but will wait until production models ordered by the Air Force are available. Lead time on these is about a year. Then NAA probably will fly the first three T-39s in the flight program for certification, which, incidentally, is to meet an Air Force requirement, not to qualify the Sabreliner for commercial sale. NAA has not decided yet whether it will undertake a commercial venture with the T-39, although J. L. Atwood, NAA president, believes the twinjet will have good possibilities in the business aircraft market provided it can get past the cost/price squeeze that has the aircraft industry jumping these days.

• **Social note**—J. H. Kindleberger, chairman of North American Aviation, has become so widely known as "Dutch" that even the society writers have fallen into the habit of omitting the formal initials in writing up the parties the Kindlebergers attend.

month—and that it will produce over twice as many—22,000 a month—in newly-generated business.

The company at present is not certificated for Detroit-Cleveland and is asking this right in CAB's Great Lakes Local Service Investigation. Hearings have been concluded, but Allegheny seeks to have the record reopened to introduce evidence on the commuter-type operation. It states that it could not give testimony on the plan at the hearings because the move to Detroit Metropolitan had not been made.

The proposal would work as follows: 21 roundtrips daily—a flight every hour on the hour from 7 a.m. to 11 p.m., with flights on the half hour during peak periods. A commuter would buy his ticket at the airport, with no advance reservation, and the time stamp on the ticket would determine boarding priority. Fare: \$7, tax included (lowest fares now are \$7.10 night coach, \$7.70 day coach, tax included). The company is also considering issuance of commuter book-type tickets at an even lower fare.

Commuter passengers would carry their own baggage. If they desired to check it, they would pay full excess baggage charges for the whole amount, with a minimum of \$1.

Reserved space would be sold to passengers connecting with other flights at Cleveland or Detroit and to passengers ticketed prior to arrival at the airport. Fare, however, would be \$9.68 including tax. These passengers would be boarded ahead of commuters, and their bags checked. Allegheny believes that as high as 25% of passengers may fall in this category.

The airline proposes to use 40-passenger Martin airplanes on the 45-minute flight. On the basis of 113,400 revenue miles per month, operating costs work out to \$1.23 per mile. Assuming that baggage, mail, express and freight produce about 5¢ a mile, and that the average ticket is \$8, Allegheny can break even with 14 passengers, or a 35% load factor. And Allegheny president Leslie Barnes believes that the operation would be subsidy-free after the first year.

Barnes also believes that the company's estimates are conservative, that operating costs and break-even load factor may be less than estimated, and that an even lower fare may be possible. "Ever since I can recall," he states, "airlines have talked at various times about a simplified, easy-to-do service, involving no reservations. We want a chance to try it. We think it will pay off."

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CAB Report & Forecast

So many air safety orders were issued during the closing days of 1958—before the CAB's authority to issue air safety regulations and orders was transferred to the new Federal Aviation Agency—that the Board's mimeograph machine broke down under the strain. Most of the orders covered violations of the air safety regulations, but one whopper was also put out: A 148-page revision of Part 41 of the Civil Air Regulations—"Certification and Operation rules for Scheduled Air Carrier Operations outside the Continental limits of the U.S." This is the third such draft circulated by the CAB; interested parties have until April 6 to submit comments.

Except for the safety regulations, the CAB workload dropped off sharply after Christmas as many employees took leave. Member Louis J. Hector, who was vacationing at his Miami home earlier in the month, suffered a back injury and was out three weeks.

• The CAB restated its hands-off position on the jet crew complement issue for the benefit of the governor of Florida, but, except for this, the Board did not get into either the Eastern or the American strikes. There was some feeling that the supplemental air carriers might have taken over more of the burden of transporting strike-grounded holiday passengers, but several of the carriers who asked for authority to operate more than ten roundtrips per month between named pairs of cities were turned down.

• Three carriers party to the six-airline mutual aid pact explained to the Board how they figure their payments to one another in the event of a strike. The pact has been signed by American, Pan American, TWA, United, Eastern and Capital. Capital told the board that during the strike from October 17 to November 22, it received \$2,247,972 in payments from the other members who had more profits because Capital was grounded.

American reported a complex formula for determining the added profits. Pan American said it (1) measured added traffic on competing segments due to a strike; (2) priced this traffic; (3) determined its added cost. The carriers generally used a base period of three weeks prior to the strike in determining added effects.

• Board shorties—The Board staff will move piecemeal to its new under-one-roof Washington headquarters this

month and no little delay and confusion is expected to result . . . some of the staff were amused, and a few were vexed to find reports in both the Wash-

ington Post and the New York Times that the CAB had gone out of business January 1 and its work taken over by the new FAA.



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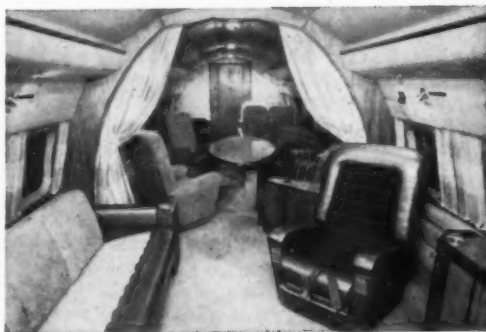


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—TRANSPORT AVIATION

... Transport Briefs

• **United Air Lines** has asked denial of TWA's petition for reconsideration of the CAB order placing a 20% surcharge on Siesta Seat Sleeper Service or discontinuance of the service. In its petition, TWA told the Board that it had reduced space between sleeper seats and increased the number of seats. United contends that the Board's original finding was not changed by TWA's putting seats in the lounge area and slightly reducing seat pitch in part of the cabin. CAB had described the service as a "distinct type."

• **The Flying Tiger Line** reports that it expects 1958 commercial operations to show a profit for the first time. President Robert W. Prescott says the carrier moved more cargo and passengers on overseas contract routes than any other carrier during the past year.

• **American Air Taxi** is now operating two roundtrips daily between Miami and Marathon, Ocean Reef and Key Largo.

• **Eastern Air Lines** and Laurance S. Rockefeller, a director and shareholder, are seeking CAB approval of an interlocking relationship which would result from Rockefeller's acquisition of control of Gruen Applied Science Laboratories, a company engaged in dynamics, electronics development and research.

• **Continued disagreement** over the proper fare level for the new jets has caused the International Air Transport Association to postpone the traffic conference scheduled for January 20 in Paris. The meeting will be held sometime in February, provided there is a good chance of some compromise agreement being reached.

• **Bonanza Air Lines** has completed its move of executive and maintenance offices into a building adjacent to its main maintenance base at McCarran Field, Las Vegas.

• **United Air Lines** upped its order for Boeing turbo-starters from seven to 28 and total cost is now estimated at \$420,000.

• **Trans-Texas Airways** has contracted to buy 22 million gal. of fuel from The Texas Company during the next three years. Delivery will be at 11 points in five states.

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EXCITING NEWS in BUSINESS AIRCRAFT

See Page 43



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BILL OLSON, Chicago station manager for North Central Airlines, gives sendoff to WWP at Midway last September when latter flies north to "collect" two new NCA airports—Manitowoc, Wis., and Iron Mountain, Mich.

—EN ROUTE—

Wayne W. Parrish

Driving Through Germany, Switzerland, France and . . . Andorra

The last extensive motoring trip I've taken in Europe, about 5,000 miles, was in the early fall of 1957. I'm a little tardy in writing about it, but believe you'll find some of the reporting of interest.

My wife and I flew to Frankfurt and back on Lufthansa, the German airline, and found the service very good indeed. Believe me, it's a pleasure to wake up in the morning and smell bacon and eggs cooking and to be able to order eggs boiled, scrambled or fried and served fresh and hot at your seat. Lufthansa dinners are fine, too, complete with choice German wines.

On the eastbound trip I had an old friend as captain, Harold "Blackie" Blackburn, one of the TWA pilots loaned to Lufthansa to put the airline back in business some years ago. Blackie, who has a farm in Bucks County, Pa. (he has a nice life), reports the Germans are coming up steadily as crew members and one of these days will be running the whole show themselves.

A one-night stop at the Frankfurterhof, one of Europe's best hotels, and saw Bill Love of TWA, and Kent Fry and Bill Voight of Pan Am, and off we went the next morning in a Mercedes-Benz 219 for a wonderful trip to Madrid through Switzerland and southern France and Andorra, and returning through southern Switzerland to Vienna and back through southern Germany. Objective was the annual IATA meeting in Madrid.

I have a very high regard and respect for Mercedes-Benz cars. They have a hot sports number, the 300SL, high in price and made for the connoisseur, but the pride of the fleet is the 300 sedan, also high in price but extremely well-made. Other models are the 220S, the 219 and the 180, and they even have a small diesel job that is tops for economy and wear.

Mercedes-Benz Just Right

Thanks to Ronnie Gall, of Curtiss-Wright, and to the New York Mercedes-Benz people, I got the loan of a factory 219, a small four-door sedan. It turned out to be just the right model for my kind of European driving. It's easy on the gas, it's small but not too small, it has good baggage space, enough power for the steepest mountain roads, is one of the most "roadable" cars I've ever driven, has all the speed you need for straightaway roads and—well, there it is. In 5,000 miles it never whimpered once and I got so attached to it I really hated

to take it back to the factory. Tried to buy it, but was told I couldn't, and if I wanted a new one I'd have to wait three or four months.

The first couple of days out of Frankfurt were so-so. We drove to Heidelberg and went to the Roter Ochse (Red Ox) for lunch. Supposed to be a hangout for students, lots of color, fine food, etc. Everybody else had read the guidebook too. It was jammed with tourists, the service was poor, and the food mediocre. Famous places are fine to stay away from in the tourist season—everybody, like you, is seeking atmosphere and something "unusual".

But the German countryside is beautiful to drive through. From Baden-Baden we went over the hills to Freudenstadt in a superb valley and spent the night in the Luz Hotel, Waldlust, recommended by AAA. Well, they can have it. Very poor dining room service, had to pay cash on the spot for the dinner because we were merely overnight guests, and charged a helluva lot for coffee in the morning. No place for an overnight stop—they want guests by the week.

On through the Black Forest, beautiful country, to Zurich and Lucerne in Switzerland, but bucking heavy road traffic most of the time. And on up the much-traveled Furka pass, with me and my 219 passing up the slowpokes, and down past the famous Gletsch glacier (source of the Rhone River) and up again over the Grimsel pass and down to Interlaken. A long day's drive, and not exactly the way to see Europe, but I was giving my wife a quick glimpse and that's all because we had a heavy schedule. The St. George's Hotel at Interlaken was pretty fair.

Ah, That Fondue Bourguignonne

A couple of busy days in Geneva. Lunch at the Mike (Douglas Aircraft) Oliveaus, and dinner with the Claude (TWA) Rands (he's been transferred back to U.S. since then). Claude introduced me to *fondue bourguignonne* at the Bar Edmond and Le Chandelier, a small spot in the old city. This is a wonderful dish. They bring you lots of small bits of beef and you cook them yourself by dipping them into boiling oil and all sorts of seasoning is available for your own taste.

Off again by some new roads, many small ones, going south from Geneva through Annecy, Aix-les-Bains, and west and south through Valence and across the

Rhone via back country and villages and beautiful scenery to Montpellier for the night. Naturally I used those super-wonderful *Guide Michelin* maps—best and most accurate in the world. The Hotel Metropole in Montpellier is quite okay, and for dinner the Brasserie Rich can turn out most any kind of good food.

Objective: Andorra

Next morning early we headed for Perpignan, following the main road around the Mediterranean. I guess I was in a hurry because both my wife and I had a prime objective on this particular trip to Spain. Having been rebuffed twice before, we were determined to reach the tiny co-principality of Andorra high up in the Pyrenees.

Andorra is one of those quaint political remnants of the middle ages that has somehow survived absorption. It is something like San Marino in Italy, Liechtenstein between Austria and Switzerland, and Monaco in France. But it is the least known to and the least visited by Americans, and one reason is its inaccessibility. It has just two roads to the outside, one into France, one into Spain, and the French road is blocked by snow seven or eight months out of the year. It has no airport, no railroad, no army, no newspapers, and no telephones unless these have been added in the past couple of years. It does have a very powerful radio station for communications.

This little country has only 5,500 inhabitants, but they do awfully well as I'll relate later. It is governed by co-princes, one being the Bishop of Urgel, who resides in the Spanish town of Seo de Urgel, the other being the President of France. There is a local Parliament. The people have been fiercely independent for centuries, and they speak Catalan, the language of the Catalonian section of northeast Spain.

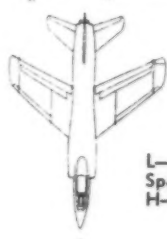
Twice before my wife and I had motored up the steep winding mountain roads to the turnoff into Andorra on the French side, and found the road blocked by snow. Both times were in May, once late May. The southern road from Spain is open all the year round, but it's inconvenient to use it unless you are passing through the country—it's a long way about from France.

So this was early September. We were praying the French road would be open this time. We wanted to see what this tiny mountain country was like. Tell you next issue.

—FOR MORE INFORMATION—

USE THE ATTACHED REPLY CARDS for additional information about any product or service advertised or reported in this issue of AMERICAN AVIATION. Circle the numbers on the card

that correspond with numbers appearing beneath items described. Requests will be forwarded to the companies concerned. No additional postage required.



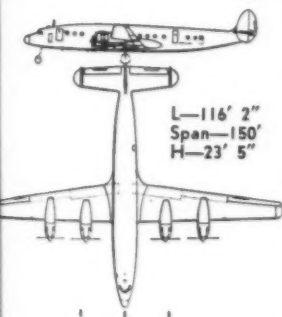
L—40' 10"
Span—31' 8"
H—12' 9"



GRUMMAN F-11F-1 TIGER (NAVY)

TYPE: single-place, single-jet, carrier-based fighter. WEIGHTS: gross—13,850 lbs. POWERPLANT: Wright J65-W-6; max. rating—7,800 lbs. st with afterburner. PERFORMANCE: max. speed—over 650 mph. No other data available. MFR: Grumman Aircraft Engineering Corp., Bethpage, L. I., N. Y.

NOTES (for your personal use):

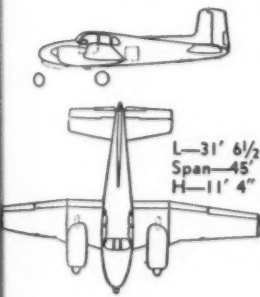


L—116' 2"
Span—150'
H—23' 5"

LOCKHEED 1649A STARLINER

TYPE: 58-92 passenger, 4-engine, commercial transport. WEIGHTS: empty—91,645 lbs.; gross—156,000 lbs. POWERPLANTS: (4) Wright R-3350-EA-2 turbo-compounds; max. rating—3,400 hp. PERFORMANCE: max. speed—372 mph; cruise speed—342 mph; initial rate of climb—1,660 fpm; max. range with 16,428 lbs. payload—5,100 mi.; takeoff distance at sea level at gross weight—6,500 ft.; landing distance at 123,000 lbs. gross weight—6,000 ft. MFR: Lockheed Aircraft Corp., Burbank, Calif.

NOTES (for your personal use):



L—31' 6 1/2"
Span—45' 3"
H—11' 4"

BEECH F50 TWIN BONANZA

TYPE: 4-6 place, twin-engine, business airplane. WEIGHTS: empty—4,460 lbs.; gross—7,000 lbs. POWERPLANTS: (2) Lycoming GSO-480-B1B6s; max. rating—340 hp. PERFORMANCE: max. speed—240 mph; cruise speed—228 mph, 70% power at 13,300'; initial rate of climb—1,620 fpm; range at 169 mph at 10,000' with 230 gal. fuel capacity—1,650 mi.; takeoff distance to clear 50' obstacle—1,250 ft.; landing distance over 50' obstacle—1,840 ft. MFR: Beech Aircraft Corp., Wichita, Kan.

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Aircraft Data Cards

AIRCRAFT SELECTED for the data cards in this issue of AMERICAN AVIATION are Grumman's F-11F-1 Tiger, Lockheed's 1649A Starliner and Beech's F-50 Twin Bonanza. Grumman's F-11F Tiger is a Navy carrier-based fighter in operational service. It is to be gradually replaced by the more advanced Super Tiger. Lockheed's 1649A Super Constellation is the last of a long line of commercial piston-engine transports to be produced by the company. Main difference between this model and earlier Super Constellations is the new wing, designed for maximum speed range characteristics. Beech's F-50 Twin Bonanza is the current production version of a long line of Model 50 series. Designed primarily for the business flying market the Twin Bonanza is also used by the military as an instrument trainer, utility, liaison and VIP transport.

GRUMMAN F-11F-1 TIGER (NAVY)



Aircraft Data Card
January 12, 1959

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LOCKHEED 1649A STARLINER



Aircraft Data Card
January 12, 1959

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BEECH F50 TWIN BONANZA



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ONE BILLION DOLLARS
in equipment it will save



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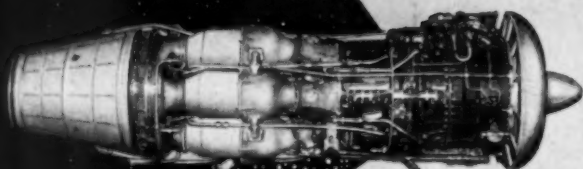
A few distributor areas are still open for the world's fastest-growing sales organization.

PERMANENT FILTER CORPORATION

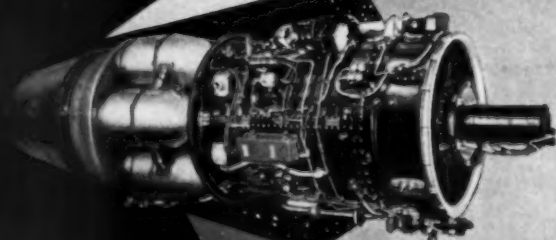
Address Department AA4, Permanent Filter Corporation, 1800 W. Washington Boulevard, Los Angeles 7, California, for additional information regarding specific filtration requirements you might have. Detailed recommendations furnished on request.

Circle No. 17 on Reader Service Card.

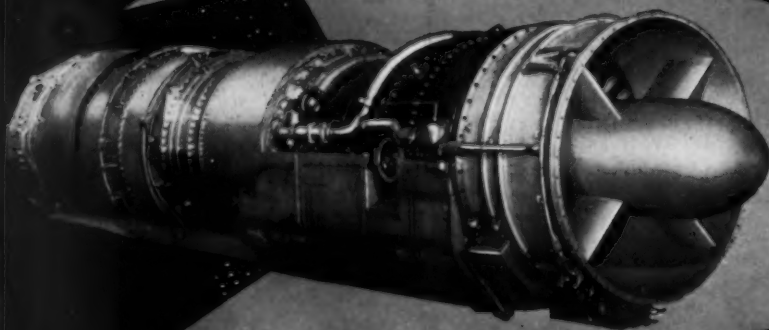


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Orenda Engines Limited
salutes the 50th Anniversary
of powered flight in Canada

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